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Beat the clock
Now's the time to test for year 2000. **Pages 4, 26, 49**

Choose your weapon
Smart pagers are lighter, easier to use. **56**

It's a new ball game
Padres win with smart cards that move product, sell as keepsakes. **31**

COMPUTERWORLD

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August 17, 1998 • Vol. 32 • No. 33 • $4/Copy

Antitrust delay?

▸ *Judge ponders opening up depositions to media*

By Kim S. Nash

THE JUDGE IN the Microsoft Corp. antitrust case will decide this week whether to accept a joint proposal from the vendor and the U.S. Department of Justice to delay the start of the trial two weeks to Sept 22.

The two parties asked for the extra time so they can devise a plan for handling public depositions of Microsoft executives, according to three sources close to the case.

Microsoft lays out strategy for beating monopoly rap. Page 6

Legal haggling last week over whether to open the depositions of CEO Bill Gates and other Microsoft executives has already put the proceedings behind schedule. Gates was due to be deposed by government lawyers last Wednesday, but wasn't.

Several media outlets asked to attend the pretrial interviews, citing a 1913 law that allows the public into antitrust depositions. Depositions usually are taken in private law offices.

When Microsoft lawyer John Warden protested that trade secrets could inadvertently be revealed, a Justice Department lawyer countered that depositions of IBM executives during that vendor's antitrust battle were attended by the press and no secrets were leaked then.

U.S. District Court Judge Thomas Penfield Jackson asked lawyers for Microsoft, the Justice Department and the media to create a plan for protecting secret information. "And we're working on it," a Justice Department spokeswoman said.

"If [the trial] is delayed, it won't be for long. The judge is adamant about keeping to a schedule," said Yee Wah Chin, an antitrust lawyer at Squadron, Ellenoff, Plesent & Sheinfeld LLP in New York.

Microsoft proposed videotaping the depositions and then handing out censored tapes, but Jackson said the law stipulates that the public can be in the room during the questioning. □

Health care CIOs endorse Y2K database

By Barb Cole-Gomolski
SAN FRANCISCO

HOSPITAL CIOS, citing potential public health risks associated with the millennium date change, last week called for widespread sharing of information about the year 2000-readiness of computerized medical devices.

Health care information technology executives gathered here for a Brainstorm Group, Inc. symposium on the year 2000 endorsed a centralized repository. It would contain compliance information, testing schemes and code fixes for commonly used information systems and medical devices, ranging from intravenous infusion pumps to life-support equipment. A central repository "could really help

Health care, page 77

BP, Amoco merger marries IT opposites

By Julia King

BRITISH PETROLEUM'S $48 billion purchase of Amoco Corp. will create the world's third-largest oil giant and one Godzilla of a systems integration challenge.

CORPORATE RESTRUCTURING

Technologically and culturally, the companies' IT operations are different species. The conservative, Chicago-based Amoco has some 2,000 IT employees worldwide. It is in the process of wrapping up a massive, three-year SAP R/3 implementation and is just starting to switch over some 10,000 user desktops from Lotus Development Corp.'s CC:Mail to Microsoft Corp.'s Outlook.

BP, Amoco, page 76

Cheap Web billing catching on

By Sharon Machlis

ELECTRONIC DATA SYSTEMS CORP. last week said it will begin to offer Web-based billing services for corporate customers this month.

The announcement is the latest sign that the market for Internet billing is heating up. "It seems like everyone woke up with the same idea one morning," said Geri Spieler, an analyst at Gartner Group, Inc. in San Jose, Calif. "This is a very hot area."

Billers said the Web will trim the expense of sending out paper bills by mail, as well as opening returned payment envelopes and processing paper checks. Gartner estimates it

Web billing, page 76

*By Laura DiDio/*HARTFORD, CONN. The workday starts **early** for **Bob McKee.** The director of information management security at **The Hartford Financial Services Group, Inc.** is in his office by **7 a.m.**, checking messages and preparing to manage a staff of 26. **On this particular July day,** McKee is reviewing notes for a late-morning meeting on ways the insurer, founded in 1810, can deal with the **growing problem of spam E-mail.**

Security trenches, page 21

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U.S. Customs' agent Don Huyche, above, fights online child porn with help from hackers. **In Depth, page 58**

Violence can strike anywhere, as the Connecticut Lottery IT staff knows. Here's how to be on guard. **IT Careers, page 60**

Linus Torvalds has a job but spends hours each day answering E-mail about his Linux operating system. **Software, page 43**

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Contingency planning seems to waste time, but William Ulrich describes how you can use it to move ahead. **27**

Your Y2K testing time may be limited, but there are ways to make the most of it. **49**

Year 2000 Scoreboard. **51**

Ed Yourdon explains how your year 2000 project team can survive "crunch mode." **52**

EXECUTIVE Briefing

News summary for senior managers

■**The killing spree at the Connecticut Lottery last March isn't the only indication that violence is a risk in IT shops. A recent study revealed that murder is the leading cause of death in the U.S. workplace for women and second for men. Techs are no more likely than others to strike out, but they often work in relative isolation, with few outlets for frustration. Page 60**

■The Amoco/British Petroleum merger means bad news for IT. Amoco has 2,000 techs; outsourcing-mad BP has 97. The companies will cut 6,000 jobs overall, with IT under particular scrutiny, despite the need to integrate vastly different enterprises that rely on IT for profit. Page 1

■The San Diego Padres are using smart cards to promote the team and sell stuff at the same time. Fans get free cards at banks and can buy Padres merchandise with them; salespeople can buy cards at the ballpark to document the cost of a client's hot dog. The boys of summer take concessions high-tech. Page 31

■A Gartner Group study shows that half of all organizations — mostly small ones — will do no year 2000 testing. That leaves more sophisticated operations with the choice of whether to help critical suppliers get up to speed or replace the supplier to avoid disruptions in the supply chain. Page 4

■NT servers require frequent reboots after administrative or hardware changes. That wastes time for the users while the servers are down. NT 5.0 will ease the problem, but its second beta is only now ready to ship. That makes Unix mighty attractive. Page 6

■Hoping to save money while helping customers exchange foreign currency, Thomas Cook launched a Web site. Now that site is making money — up to 15% of the division's profits — by saving customers time and effort. Page 33

■MCI gave Egon Zehnder International a 40% discount on equipment for a new network in return for a three-year, $900,000 commitment for network service. The recruiting company thinks that's a great deal and will also give it just "one person to yell at" in case of trouble. Page 39

■John Gantz advises users to build their sites for lowest-denominator computing to accommodate handheld devices that are becoming ubiquitous. Page 27

■Smart pagers can let you respond to pages without finding a phone, but they're heavier, they kill batteries quicker and you have to pick your paging plan carefully. We review a sampling. Page 56

■Why not switch from Notes or Exchange to one of those free E-mail services on the Web? Because free mail doesn't handle the scheduling and other groupware functions many users depend on, and E-mail is too critical to leave responsibility for it to a stranger. Page 33

Lending a Y2K helping hand

▸ *Large firms worry about supply-chain snafus*

By Thomas Hoffman

MANY SMALL and medium-size businesses have no year 2000-readiness plan, which leaves big companies in the irksome position of deciding whether they should lend a hand to limit their own supply-chain disruptions.

Half of all organizations worldwide don't have any plans to conduct year 2000 tests on their computer systems, according to a new Gartner Group, Inc. study. Most of the participants in the study of 15,000 companies in 87 countries were small companies, the Stamford, Conn.-based consultancy said.

The implications for larger companies are real, users and analysts said.

When suppliers are difficult to replace, "we have to provide whatever assistance we can."
– John D. Ogens, Monsanto Co.

If a small but critical business partner falls behind in its year 2000 efforts, "corporate leaders must decide whether to replace that supplier," said Charles C. Wiberley, MIS manager at The PMA Group, a property and casualty insurance company in Blue Bell, Pa.

But when suppliers are difficult to replace, "we have to provide whatever assistance we can," said John D. Ogens, director of the global year 2000 program at Monsanto Co. in St. Louis.

Phil Murphy, a senior advisor at Giga Information Group in Jupiter, Fla., said the problem will produce some cooperative year 2000 efforts.

At some level, "you'll see big businesses driving year 2000 repair work at smaller companies because they know they rely on small businesses to survive," Murphy said.

Skip Littell, the year 2000 project manager at Eli Lilly & Co.'s marketing group in Indianapolis, said big companies should consider the supply chain an extension of their organization.

That's the view at General Motors Co., which identified 40,000 of its more than 100,000 suppliers as necessary to becoming year 2000-ready. Each has a potential impact on business continuity, said a spokesman at the Detroit-based auto giant. Where needed, representatives from GM's year 2000 project team will visit a supplier's site and share procedures and software tools with them, the spokesman said.

MIXED OPINIONS

Year 2000 project managers and chief information officers are divided about whether big companies should help smaller ones by lending them staff or acting in a consultative role.

NAC Re Corp., for example, is reviewing year 2000 project plans for a small outsourcing vendor that processes third-party policy information "and making sure they have the best procedures in place," said Linda Kuppersmith, year 2000 compliance coordinator at the Greenwich, Conn.-based reinsurance company.

But with about 500 days to complete their millennium conversions, many big companies themselves are short-staffed and overwhelmed with project details. "I can't see lending staff" to smaller businesses, said Cathy Hotka, vice president of information technology at the National Retail Federation.

The Washington-based trade association is trying to help smaller retailers by sending a list of year 2000-related checkpoints to 80,000 industry suppliers this month.

Earlier this month, the Automotive Industry Action Group (AIAG) in Southfield, Mich., extended a year 2000 assessment program to 40,000 so-called sub-tier suppliers.

The service includes access to AIAG's year 2000 tips and techniques database and to a help line staffed by consultants from Deloitte & Touche Consulting Group and PricewaterhouseCoopers LLP. □

How to make the most of your year 2000 testing. Page 49

NT Service Pack: Next month

By Laura DiDio and Sharon Gaudin

USERS WHO have been anxiously awaiting the now very late Service Pack 4 for Windows NT 4.0 should finally see it within the next month, Microsoft Corp. officials said last week.

"Service Pack 4 is in very good shape, although it is late. But we expect to ship it within 30 days after the Windows NT 5.0 Beta 2 release ships," said Mike Nash, Microsoft's director of marketing for Windows NT. He said the company is close to shipping the NT 5.0 Beta 2 software (see story, page 16).

WINDOWS NT SUPPORT

Service Pack 4 contains bug fixes, feature enhancements and some new NT features. It is the first service pack the Redmond, Wash., software company has shipped in nearly a year — even though Microsoft executives last year pledged to ship a Service Pack each quarter to supply businesses with up-to-the-minute hot fixes for NT bugs.

The tardiness of Service Pack 4 — which was originally due about six months ago — has left some irate users in the lurch.

"SP4 should be called Security Pack 4 because it contains between 10 and 20 security-related hot fixes for known security flaws," said Stu Sjouwerman, executive vice president of SunBelt Software, Inc. in Clearwater, Fla. Sjouwerman said many users have essentially been left in "hot-fix hell."

Robert Aitchison, manager of servers and services at Data Systems West in Woodland Hills, Calif., said the lack of information on Service Pack 4 is "unacceptable" because he has had to separately manage the individual hot fixes issued by Microsoft.

"It's quite a chore. If you install the hot fixes in the wrong order, you can have an unstable system," Aitchison said. "Also, some of the hot fixes have been recalled, but there wasn't much information about the recalls, and you might not even know unless you checked the directory on the [file transfer protocol] site it was originally in."

Other users, such as Bob Frase, CIO at United Paperworks International Union in Nashville, voiced similar complaints. He said his biggest problem is finding out a fix is available, then figuring out which ones he needs in the absence of any solid information from Microsoft.

"We used to have the same problem with IBM," Frase said. "They'd promise you stuff . . . and then deliver 18 months later. That's one of the reasons we left IBM. I don't know where you go after Microsoft. But if they continue to do this stuff to you, you're going to be out there looking for alternatives."

Nash said the delay in Service Pack 4 was caused by the company having the same development team working on both the Windows NT 5.0 Beta 2 release and the service pack. "In the future, we'll avoid this problem by having separate development teams," Nash said. □

NT 5.0, meanwhile, may be too big for some users. Page 39

Study: PC discounts to double by year's end

By April Jacobs

PC PRICES are falling faster and farther than ever before, according to an unreleased study by International Data Corp.

IDC predicts that starting this fall, average PC shelf prices will drop as much 19% each quarter — up from a 12% to 15% rate so far this year — and are expected to reach new lows by the end of the year.

Moreover, corporate buyers are likely to see their vendor discounts double by the end of the year, an IDC analyst said.

DEMANDING MORE

Corporate users said they are already getting good deals as a result of the price wars this year and are taking advantage of vendor competition by playing hardball on prices, demanding better service and getting more capability for the money.

"The way prices have been falling makes you weigh out whether you can wait a month to see how much the prices drop again," said Craig Hanson, LAN administrator at Deloitte & Touche in Anchorage, Alaska.

Hanson said price haggling with vendors has cut the average cost of his PCs by 25% to 35% since last year.

"We're finding vendors will throw in extra memory and are willing to package other stuff with the system," said Hilly Fuchs, assistant vice president of information systems at Continental Grain Co. in New York.

"We're finding vendors will throw in extra memory and are willing to package other stuff with the system."
– Hilly Fuchs, Continental Grain

According to Fuchs, Continental Grain has been able to double the size of its PC hard drives and memory for less money compared with a year ago.

Joe Loiselle, an analyst at IDC in Framingham, Mass., said users may see consistent monthly price reductions as PC makers battle for volume sales. That's becoming more important than profit margins on individual units.

Loiselle said users care less about brand loyalty and more about price because there is little differentiation among the machines from top-tier vendors.

In addition to the usual reasons for the PC price war — fierce competition and falling component prices — a new wrinkle is that buyers appear more willing to forsake Intel Corp. processors for less expensive chips from Advanced Micro Devices, Inc. (AMD) and Cyrix Corp., analysts said.

ZD Market Intelligence in La Jolla, Calif., interviewed 2,624 businesses and found that 34% "were considering purchasing PCs with either AMD or Cyrix processors." But that phenomenon is limited to the low-end PC market. Intel will introduce its latest Celeron processor, code-named Mendecino, Aug. 24. It is aimed at the sub-$1,000 PC market. □

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Microsoft: We're not a monopoly

▸ *Denies PC operating system market exists*

By Kim S. Nash

IS MICROSOFT CORP. a monopolist?

That question may seem like a no-brainer to some. But in its most detailed defense yet against antitrust charges, Microsoft last week argued that it has no monopoly in PC operating systems and then asked the judge to throw out all or some of the charges against it.

The U.S. Department of Justice called Microsoft's claims "nothing new," but legal experts said the arguments raise questions about whether the vendor can beat the monopoly rap.

Among the key points postulated by Microsoft in court papers filed last week were the following:

- Because adding Internet features to Windows was Microsoft's idea in 1992 — before Netscape Communications Corp. was launched — melding Internet Explorer with Windows couldn't have been a move to stomp out its rival.
- Microsoft's contracts with Internet service providers, content companies and PC makers are legal and didn't stop Netscape from getting its browser out.
- Microsoft doesn't hold a monopoly because there is no discrete market for Intel Corp.-based PC operating systems, and Microsoft can't control operating system prices.

GOVERNMENT'S CASE

At the trial, which may now open Sept. 22 (see story, page 1), the government will argue that larger patterns of behavior by Microsoft are illegal, in part because of its dominance in the PC software market, said Rich Gray, an antitrust lawyer at Bergeson, Eliopoulos, Grady and Gray LLP in San Jose, Calif.

"The government's argument is not so much that Microsoft was just trying to win a new market by using monopoly power, but that they were using the browser market to protect the original monopoly in operating systems," Gray said.

"It's a more serious charge" that is harder to defend against, he added.

Yet Microsoft CEO Bill Gates, in the company's early days in the late 1970s, used to say that he wanted "to monopolize" PC software, according to Mark Stephens, who writes an industry column under the name Robert Cringely.

Gates has since expunged the word "monopoly" from his vocabulary.

And other Microsoft executives have also tried to sanitize their language in other ways.

For example, when trumpeting the success of Windows to the public, they speak of PC operating systems "sales" and not of a PC operating system "market," which is an important distinction in antitrust circles.

"Microsoft doesn't want to put any boundaries on where it does business. That would open it up to the charge that it knew it had a monopoly in a certain area and therefore perhaps shouldn't have done some of the things it did," said Yee Wah Chin, an antitrust lawyer at Squadron, Ellenoff, Plesent & Sheinfeld LLP in New York.

Taking it one step further, Microsoft now contends in its legal papers that there is no separate market for PC operating systems for Intel-based hardware. Instead, contrary to how many in the industry define the relevant market, Microsoft, in its court filing, defined it as "at the very least all operating systems for minicomputers, workstations and all varieties of [PCs]."

The broader definition means Windows doesn't dominate. □

DUELING E-MAIL

Microsoft and the government will use E-mail sent by Microsoft managers to bolster their respective cases, including these messages:

Government ammunition to show that Microsoft wanted to stomp out competition from Netscape:
"I am convinced we have to use Windows ... [M]ost importantly it must be a killer on OEM [PC maker] shipments so that Netscape never gets a chance on these systems."

– JIM ALLCHIN, SENIOR VICE PRESIDENT, JAN. 2, 1997

Microsoft's return fire, to show that it planned to add Internet features to Windows before Netscape was born: Microsoft "could really help popularize Chicago [Windows 95] if we could say that Chicago is the greatest front end to the Internet."

–STEVE BALLMER, THEN GROUP VICE PRESIDENT OF SALES AND MARKETING, DEC. 7, 1993

Source: Court filings and other documents

Microsoft to roll out training plan for IT execs

By Sharon Gaudin

MICROSOFT CORP. this month plans to launch a marketing and training program designed to reach out and touch an estimated a million IT professionals in the next year.

The effort is part of Microsoft's recently announced commitment to pour $200 million into various service and support programs, specifically targeting corporate customers.

While many vendors routinely take training programs on the road, Microsoft says this effort — with its particular emphasis on SQL 7.0 — is unique because the approach starts with selling the seminars to chief information officers in an effort to get their staff out in force to these promotional and educational events.

"Microsoft sometimes is a tough group to get visibility with, so this would be great news," said David Johns, vice president and CIO of Owens Corning in Toledo. "I'd like them to tell me what's coming down the road, what's available to me and what problems I'm going to be facing without stumbling upon it on my own."

"This is a fundamental change in approach that customers who buy from Microsoft can expect to have a relationship with us at multiple levels," said Jonathan Murray, Microsoft's general manager of worldwide enterprise technical marketing. "We're in the business of making sure that when a customer buys a product, they know how to deploy it."

Microsoft said the initiative will consist of full-day programs, that will include a few hours of demonstrations and sales pushes and then training sessions focused on specific areas. Training pods are slated to include application development, network administration and desktop administration.

Bill Peterson, an analyst at International Data Corp. in Framingham, Mass., said Microsoft needs to do a better job of connecting with its customers if it wants to move into the enterprise. "The perception is that they sit on high handing out operating systems and service packs and saying 'Take it or leave it,'" Peterson said. "That's not going to work for enterprise customers." □

Reboot frenzy to end with NT 5.0

By Sharon Gaudin

PHONES RING unanswered. Frazzled operators scribble orders on paper scraps while spilling out apologies to frustrated buyers. Production workers stand idle because they have no orders to ship. The company is losing money as the seconds tick by.

No, the company didn't lose power. The system didn't crash. The IS manager simply had to add disk space, and that means taking down Microsoft Corp.'s Windows NT operating system.

The scenario is a familiar and frustrating one for many information systems managers. Literally thousands of simple NT maintenance tasks require NT 4.0 to be rebooted. Depending on the task, that could take minutes or even hours. Depending on the size of the NT installation, that could happen once every week or several times per day. And from where some IS managers sit, it makes Unix look very attractive, which in turn isn't helping to move NT to the enterprise space.

Microsoft executives said the reboot frenzy will come to an abrupt end with the release of Windows NT 5.0, which has no official ship date. Beta testers will get a preview with Beta 2, which reportedly will ship this week (see story, page 16).

Jonathan Perera, Microsoft product manager for Windows NT server, said the number of times that maintenance tasks require NT to be rebooted will plummet from the current thousands in NT 4.0 to between just five and 15 in NT 5.0.

That's welcome news to corporate users who are accustomed to never having to reboot their Unix systems for simple maintenance work. "I got off [NT] because I couldn't even change PC cards without having to reboot it," said Teresa Light, vice president of software development and implementation at Bradley Co. in Cleveland. "If they could clean up rebooting, I just might go back to it." And Light isn't alone in her frustrations.

Bradley Co.'s Teresa Light couldn't change PC cards without rebooting NT

"There's no such thing as a quick reboot," said Patrick Garrett, senior NT systems administrator at PacifiCare Health Systems, Inc. in Cypress, Calif. "Say you're running a server, and you have 600 people on it. You have an application that gets jazzed up. You can't start it. You can't stop it. You have to reboot, but what about the other 590 people on the box? We have to limp along until we can get everyone off. If I was running Unix, that wouldn't happen." Those kinds of problems, which take up IS time and money, can block NT from servicing enterprise-level business processes.

"If you have a transactional environment and you take 30 minutes out of the day, that could throw the whole day," said Randall Kennedy, an analyst at Competitive Systems Analysis, Inc. in Danville, Calif. "That's [why] we still recommend using Unix for high-transaction services." Limiting the number of necessary reboots to 15 or less would make a huge difference in NT's availability, but Kennedy called that an ambitious undertaking. □

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CIOs discuss hot-button issues

It's common knowledge that corporate America is suffering from an IS staff shortage. But you may be surprised at what chief information officers are looking for in prospective employees.

Instead of searching for workers with deep technical backgrounds, companies increasingly prize individuals with customer service skills, those who are fast business and technology learners, and enthusiastic business students.

That was the consensus of senior information systems professionals from several vertical markets who gathered in Natick, Mass., last week at the invitation of 3Com Corp. They met to discuss a number of issues, including the challenges of mergers and acquisitions, security and pitching projects.

Computerworld senior editor Bob Wallace participated in a roundtable with James Barry, CIO at Insurance Holdings of America LLC; Will Weider, CIO at Trinity Regional Health System; Niraj Patel, CIO at GMAC Commercial Mortgage Corp.; and David Stone, IS manager at Eide-Bailly LLP.

CW: What are you looking for in prospective IS staffers?

STONE: We've hired technonerds, but they can't deal with the [end-user] customer. We're looking for people with a customer service background and would take them any day over the sharpest network people.

WEIDER: We just want someone with aptitude, because we can teach them the business and technology. The manager of our emergency room left management to join IS. She had no formal computer experience [but became] a star employee. And we have a 16-year-old intern to whom I'd rather give a project than someone who has been around for years.

BARRY: We recruit aptitude over experience. We have an 18-year-old, and when we have a mission-critical project, he goes on it. He's also on our second support shift.

PATEL: We went to deans at [the University of Pennsylvania and its Wharton School] and Drexel [University] and told them we'd take 10 of their students every year and work them through our shop. They learn the business and technology. Now the deans come to us [recommending] their most talented students.

Roundtable participants (clockwise from top left) James Barry, Will Weider, Niraj Patel and David Stone

CW: How do you cope with your organizations' mergers and acquisitions?

PATEL: We've done four already this year, with five more planned by year end. We're involved from Day One in [our company's] acquisition process. Our president gives us 30 days from when the deal closes to have things integrated. The challenge is to have good, stable products that can go in fast and clean and be efficient and reliable.

STONE: Standardization of hardware and software is paramount. We standardize down to the wallpaper. You want the technology to be ancillary [because what people are interested in after acquisitions] is 401(k)s and whether they still have to co-pay when they go to the doctor.

CW: What steps are your companies taking to address security issues?

BARRY: We have a staff member that performs penetration testing on a quarterly basis [because] we have private and sensitive medical information. He's in front of me every day with another way to get in to the network.

PATEL: We have a third party do monthly penetration studies, and we [undergo] a mass internal security audit every year in which [people] try and hack in [to our system] from everywhere. We're not allowed to compromise on security.

CW: What beyond demonstrating return on investment goes into selling projects to your superiors?

WEIDER: You have to build trust with senior management. We have a personal relationship, and they trust us. They're not interested in how the technology works, no more than they want to hear how electricity works.

PATEL: We have to put together the numbers, [but] they also look at our past track record and give us flexibility. At the end of the day, it becomes, do you really need this? And we benefit from having a president who's very visionary. □

NetWare 5.0 ready a month early

By Laura DiDio

BY SHIPPING its NetWare 5.0 operating system a month ahead of schedule, Novell, Inc. is giving some of its customers another weapon in their year 2000 upgrade arsenals — and also bolstering the business case for NetWare.

Several of the new features make a compelling case for upgrading to NetWare 5.0, according to eight users interviewed by *Computerworld* last week. Those features include an updated version of Novell Directory Services (NDS), native TCP/IP and bundled entry-level versions of Oracle Corp.'s Oracle8 database and the Zenworks management utility.

"Getting NetWare 5.0 ahead of time means that I should be able to complete the upgrade of my 89 NetWare 4.x servers in a nine-state area within three months," said James Graham, network architect at BellSouth Business Systems, Inc. in Atlanta. "This is crucial since the year 2000 upgrade is looming, and we expect to devote all of 1999 to year 2000 issues."

NetWare 5.0 pricing represents a 10% increase from NetWare 4.0 pricing

PRODUCT	PRICE
NetWare 5.0 server, five-user license	$1,195
25-user license	$2,750
50-user license	$4,125
100-user license	$6,995
250-user license	$13,495
500-user license	$26,995

Source: Novell, Inc., Orem, Utah

A MIGRATION HEADACHE

Not all users were as optimistic. Sharon Pryor, manager of network services at The Toro Co. in Minneapolis, said her company is sticking with NetWare 4.11 until its year 2000 issues are resolved.

"We have looked at NetWare 5.0 — and it looks like it will bring some nice features to the table — but it's a big migration. And we've got more than enough on our plates with year 2000," Pryor said.

For BellSouth Business Services, the lure of NetWare 5.0's advanced feature set — particularly NDS and Zenworks — offers enough of a business case to migrate now. Those functions, Graham said, tipped the scales in favor of NetWare vs. Microsoft Corp.'s Windows NT Server.

BellSouth Business Systems uses NT as an application server but has rejected it as an enterprise network operating system because the domain directory model just doesn't work well in the wide area. Also, the cost of ownership is too high, Graham said.

"A move to Windows NT would mean tripling my support staff, and I'd have to upgrade a lot of equipment. By contrast, NetWare 5.0, since it has just 10 million lines of code, can run on a 486 server with 64M bytes of RAM," he said.

"The upgrade costs to convert to NT would be incredible: $15,000 to $20,000 per server, and we'd have to upgrade at least 20 of our servers," Graham said.

Robert De Cardenas, network coordinator at the Florida Supreme Court in Tallahassee, agreed. He has been beta-testing NetWare 5.0 since early spring and cited its lower total cost of ownership, native TCP/IP and NDS as compelling reasons the court chose a NetWare upgrade over a migration to NT.

"It costs us about 20% less to own and manage NetWare than it would to move to NT," De Cardenas said.

Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston, said he estimates a "30% to 40% cost increment associated with managing NT domain directories. The time and resources presently needed to configure and manage NT for the enterprise are prohibitive. This includes the cost of adding servers, network management personnel, new switches and routers." □

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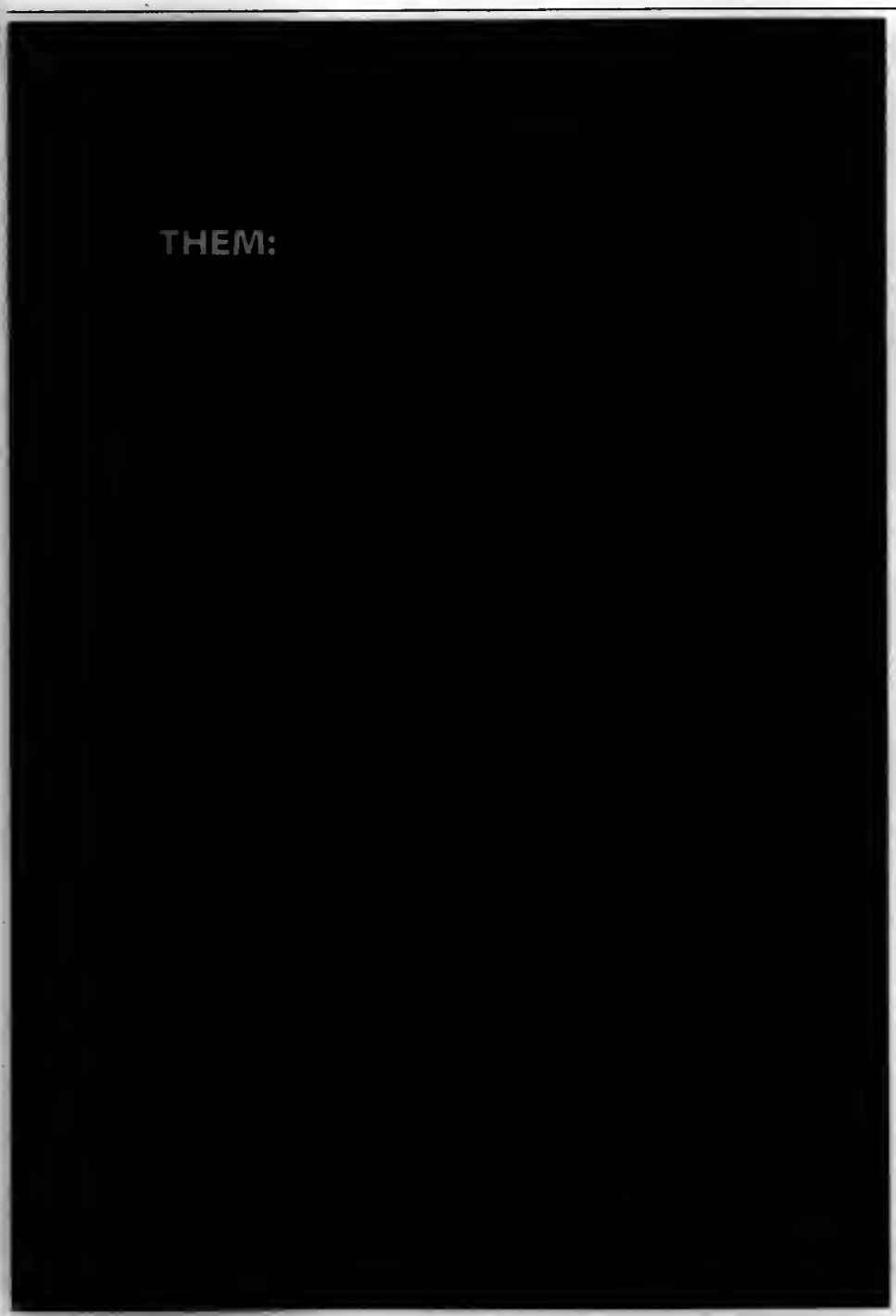
PowerBuilder upgrade focuses on Web

By David Orenstein
Los Angeles

WITH SOME DEVELOPERS considering jumping ship for more Web-savvy tools, Powersoft last week announced several Internet enhancements to PowerBuilder — software that once pioneered client/server development.

Some developers at Powersoft's user conference said they tempered their enthusiasm, but others were more inclined to believe that PowerBuilder has a bright future in the Internet age. To inspire that belief, Powersoft's parent company, Sybase, Inc. in Emeryville, Calif., promised users software — to be delivered this fall — that will instantly convert PowerBuilder applications to Java applications that can run on Java virtual machines, including Web browsers.

The company also announced a new version of its PowerJ tool, as well as an application server. Analyst Larry Perlstein at Dataquest in San Jose, Calif., said the PowerBuilder-to-Java software, dubbed the Web Deployment Kit, will serve as a stopgap until the company comes out with stronger tools for distributed computing later next year.



FALLING DOWN

PowerBuilder sales estimates

1995	$118.9M
1996	$135.3M
1997	$92.6M

Total current licenses: More than 400,000

Source: Dataquest, San Jose, Calif.

In Aurora, Colo., businesses soon may be able to handle municipal taxes and licenses online if the kit can quickly and inexpensively move the city's current PowerBuilder applications onto the Web, according to city application programmer Dany Santee. "It just opens up where management wants to go without in-house Java training," he said.

Shaun Twist, corporate information manager at AgPro Grain in Winnipeg, Manitoba, called the kit "absolutely incredible." AgPro developers had been faced with either rewriting a PowerBuilder grain-accounting system in a Web-enabled language or using Citrix Systems, Inc.'s WinFrame to deliver to thin clients. Twist said he wonders about the performance of the applications on client machines with 28.8K bit/sec. dial-up connections.

CONCEPT PRAISED

Guy Gardner, chief research and development scientist at Dynamic Healthcare Technologies, Inc., which is currently alpha-testing the kit, said its performance exceeds that of WinFrame and Symantec Corp.'s PCAnywhere. Dynamic, in Waltham, Mass., makes reporting software for pathology labs and bospitals.

Most users praised the concept of the conversion kit, which is based on Corel Corp.'s JBridge tool. But some, such as Jon Rice at Sony Corp. Electronics, wanted to see more. "If it works, we'll probably want to use it with any application," said Rice, a senior applications analyst. Both Rice and Twist said they have been forced to consider alternatives to PowerBuilder to reach the Web. Sybase also announced several other products at the conference that were designed to increase its Internet appeal to users it may otherwise lose.

PowerBuilder 6.5 and PowerJ 2.5, available for $2,995 and $1,495, respectively, now include Sybase's PowerSite Web site tool. All three tools will be bundled this fall in its Enterprise Application Studio. □

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FRANKLY SPEAKING

Top 100 revisited

FRANK HAYES

Well, I asked for it, with my list of the top 100 IT products of the 20th century. And you let me have it.

I'm still digging my way through the landslide of responses. In the first week after my column was published, you came up with nearly 100 more products and technologies you thought belonged on the list.

But in your collective judgment, a handful of IT products were highly conspicuous by their absence from the list. This time, you get your say.

IMS and CICS were so closely tied to IBM's System 360 mainframes that I figured they shouldn't be listed separately. You, um, clarified that for me. IMS and Cobol are "the backbone duo of every major DP shop I have ever been in," one reader said.

"IMS was amazing. It put a wall of software and constraints, managed by experts, between bug-writing programmers and critical corporate databases," another said. And still another: "Have you ever tried to design a manufacturing bill-of-materials database using a relational model?"

And CICS? "Probably the most important single piece of software IBM wrote."

"Without CICS there would be no 3270s or DB2."

"The granddaddy of anything and everything that's online."

I left out Digital's **VMS** operating system because it was also closely tied to its hardware. But an ex-IBMer wrote to praise it as "one of the best operating systems ever built." And yes, I did "screw one up big time!" in misnaming the Digital VAX 11/780 as a PDP-11/780.

Seymour Cray's supercomputers for Control Data Corp. and Cray Research have never been IS shop mainstays, but that didn't stop readers from nominating the CDC 1604, 6600 and 7600, and the Cray 1.

"Where is the **Cisco router?**" another reader wailed. Oops. No excuses on that one. I should have included it — I fouled up.

"The **metal 16-inch printline ruler** was certainly as beneficial as the [flowchart] template!" And apparently more widely used, especially in the days of tab machines.

it's nice to stop now and then to see how much history we cart around.

Both **C** and **Perl** got multiple nominations (though, notably, not C++). And though **Unix** showed up on the list as Linux, Xenix and Ultrix, that wasn't enough for one true believer: "It is from where all else flows. Any of the earlier [operating system] incarnations can be viewed as precursors to which Unix filled the void in functionality and 'nice to haves.' "

Amen and hallelujah, brother! But Unix and the languages it begat didn't hit IS shops in a big way until well into this decade.

Unaccountably, lots of people mentioned the **Commodore 64**. "It may not be a real IT item, but you can't just ignore it!" one reader said.

And fans of the legendary **Xerox Star** said it "had tremendous impact"; it was Xerox that was "responsible for the GUI, window managers and the mouse — not Apple or Microsoft." Well, strictly speaking, the mouse came from the Stanford Research Institute, the graphical user interface (GUI) came from Symbolics, and the Star never showed up in any IS shop outside Xerox. But it's a nice thought.

One reader even nominated the **Sherman Antitrust Act** (but didn't specify the IBM, AT&T or Microsoft implementation).

Yes, I'm still listening. And you can still find the complete list on the Web at *www.computerworld.com/more*.

Check it out. We spend so much time putting out fires that it's nice to stop now and then to see how far we've come and how much history we still cart around with us each day.□

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORTS

Java joust continues

Microsoft Corp. reiterated in court papers last week that its implementation of the Java programming language complies with the contract it signed with Sun Microsystems, Inc. Sun is suing Microsoft, accusing it of violating the terms in its Java license by adding Windows-only features to Java. A hearing is slated for Sept. 4 in San Jose, Calif.

Novell seeks NetWare apps

Figuring that software companies are more likely to develop applications for its operating system if it owns a piece of them, Novell, Inc. recently invested $10 million in four networking companies. They are: Evergreen Internet, Inc. in Chandler, Ariz.; GlobalCast Communications, Inc. in Fremont, Calif.; NetPro Computing Corp. in Scottsdale, Ariz.; and NetVision, Inc. in Orem, Utah. Novell officials estimate there are more than 300 third-party applications available for NetWare 4.x and the forthcoming 5.0 release.

GeoCities settles complaint

In the Federal Trade Commission's (FTC) first case involving Internet privacy, top-10 Web site GeoCities has reached a settlement over a complaint that the site disclosed users' demographic information to advertisers — despite assuring users that such data wouldn't be released without their permission. Under the settlement, GeoCities must post a prominent privacy statement, allow users to access and remove their data, and obtain parental consent before collecting any information from children 12 and under. The Santa Monica, Calif., company said it denied the FTC's charges but wanted to settle the matter quickly.

CONTRACT OF THE WEEK

Customer: Comdata Corp., Brentwood, Tenn.

Prime contractor: IBM, Somers, N.Y.

Terms: $150 million, through April 2005

Highlights: IBM will manage Comdata's data centers at three locations, as well as networks, desktop management and disaster recovery. Comdata is an information services firm for 17,000 trucking companies and 8,000 truck stops.

Solaris queue forms . . .

Sun Microsystems, Inc. last week decided to make its Solaris operating system available free to noncommercial developers and was deluged by more than 18,000 requests. It warned students and scientific research firms to expect significant delays when ordering a free copy from *www.sun.com*. Sun's move is being seen as a riposte to the freeware Unix, Linux, and its rapidly growing popularity.

. . . and score another for Linux

Yet another product appeared for the Linux operating system last week: a suite of directory products from Innosoft International, Inc. in West Covina, Calif. The suite includes a directory server, a proxy server and a client software development kit. It is shipping now for Red Hat Software, Inc.'s Linux 5.1. Pricing wasn't available. (For more about Linux, see pages 30 and 43.)

Microsoft updates bug patch

Microsoft Corp. last week posted updated security patches for the long filename bug that can affect its Outlook 98 messaging and collaboration software and Outlook Express 4.x. Microsoft also warned users that a purported fix circulating via an E-mail attachment doesn't fix the problem. Meanwhile, Microsoft announced that the beta version of Outlook 2000 is shipping.

Free stuff for your site

The Dow Jones Publications Library in New York now has a program that will allow public Web sites and corporate intranets to search its news library and archives for free. Site editors can use a special tool kit to develop links to the library. Searches are free, but full articles cost $2.95 each. The library includes archives for *The Wall Street Journal* and numerous other publications.

SHORT TAKES The Microsoft Network (*www.msn.com*) inadvertently blocked legitimate mail being sent by some MSN users last week after it reconfigured its mail servers to block spam. . . . IBM has unveiled a new ThinkPad 600 notebook. It has a 233-MHz Intel Corp. Pentium II processor, a 12.1-in. active-matrix display and CD-ROM, and weighs 4.7 pounds. Pricing starts at $3,199. . . . Year 2000 project milestones have slipped by an average of 12%, according to a survey of IT managers at 116 companies and 14 government agencies conducted by Cap Gemini America LLC in New York. . . . Netscape Communications Corp. last week introduced Process Manager 1.0, designed to help companies create and manage workflow applications to be used over extranets. Due this fall, pricing begins at $9,995. . . . This week, Unisys Corp. will announce a three-year, multimillion-dollar outsourcing contract with Integrated Health Services, Inc., which operates 2,000 health care facilities in 47 states.

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Carrier strike rings warning bells

▸ *Corporate users realize need for network backup plans*

By Matt Hamblen

LAST WEEK'S short labor strike against Bell Atlantic Corp. reminded business customers that they can be left up the proverbial creek without a local carrier alternative.

Fortunately, the strike by 73,000 workers against the New York-based carrier lasted only two days, posing no significant disruptions, Bell Atlantic and several large customers said.

However, the strike alerted corporate users to the need for a network backup plan during strikes.

But users bemoaned the dearth of alternatives to the local telephone monopolies, which have competitors only in the largest cities. And even those competitive local exchange carriers usually depend on the Baby Bells for their services.

"None of the alternative carriers have truly ubiquitous service," said Scott Matluck, president of the Communications Managers Association (CMA), a large user group based in Morristown, N.J.

"This time the strike was at Bell Atlantic. But next time it will be another carrier, and that's the reason a lot of our CMA companies have tried for years to diversify services," he said.

Even in Manhattan, with its Wall Street brokers and large banks, the alternative carriers don't wire every building, Matluck said.

The Bell Atlantic strike lasted two days

John Cunnane, manager of distributed systems at Insurance Services Office, Inc., said he hasn't been able to find an alternative local carrier for his corporate headquarters in Pearl River, N.Y.

Cunnane has arranged for MFS, a WorldCom, Inc. subsidiary, to direct 20% of his company's traffic into a Manhattan-based insurance database, but he said the company couldn't operate without Bell Atlantic service.

PLAN OF ACTION

"Obviously, we didn't see the impact of a nasty, drawn-out strike, but it was a warning to network managers to look at where you can cost-effectively have backup," said Jeff Hafer, a board member of the International Communications Association, a large user group based in Dallas.

Hafer and analysts suggested several ways for users to deal with strikes against local exchange carriers:

- Lobby upper management to locate offices in areas where alternative carriers operate.
- Through user groups, lobby the Federal Communicatioos Commissioo and Congress to provide a more competitive landscape.
- Keep in close touch with your local Baby Bell service representative — before an expected strike — to explain your company's needs and to see if orders for new services will be delayed.

Matluck said the tentative labor cootract should have covered five years instead of two to give business customers a greater sense of security.

A Bell Atlantic spokesman said the strike didn't jeopardize voice and data services but disrupted some directory assistance and delayed processing of new service orders for two days.

The spokesman said the carrier has good labor relations, so business customers should have confidence that the unionized carrier can provide reliable service, even wheo the new contract expires. □

Lawmakers to vote on spam bills

▸ *As California tackles E-mail issue, some debate Antislamming Act*

By Roberta Fusaro

IN THE LATEST state to tackle the issue of unsolicited E-mail, California lawmakers this week are slated to vote oo two bills that would give Internet service providers and their customers the right to block spam.

Coming up for vote this week is a bill that would let Internet service providers determine policies for sending unsolicited E-mail advertisements to customers. Another measure to be voted on this week would require E-mail marketers to tag pornographic messages and include contact information for users who want to stop receiving the messages.

The California proposals and recent moves in Congress are part of ao ongoing debate about the rights of advertisers and the demands of Internet service providers and E-mail users.

Direct marketers don't want a legal block on a cost-effective means of doing business. And Internet service providers are afraid they'll have to bear the financial brunt of carrying and filtering spam.

Spam is one reason businesses don't use free E-mail services. Page 33

Some antispam advocates and Internet providers are still concerned about a recent endorsement by a U.S. House subcommittee of a spam-related amendmeot to the Consumer Antislamming Act.

Junk E-mailers would be required to identify themselves in messages and would be fined up to $15,000 for using fake return E-mail addresses.

But antispammers say the bill (HR 3888) would provide a mechanism by which spammers could send a high volume of E-mail legally.

A versioo of the bill was passed in the Senate and will be considered by the House Commerce Committee next month.

Washington-based attorney Ray Everett-Church, a cofounder of the Coalition Against Unsolicited Commercial E-mail, said the bill as written sends the message that spam is a reasonable method of marketing.

Spam today is dominated by those who can generate remarkable volumes of junk E-mail — sometimes millions of messages per day — with just a PC and an Ioternet connection, Everett-Church said. Companies usually equip their networks based on the oumber of users and projected use, he said, and spam can throw that equatioo way off.

Io the House version of the bill, spammers would be required to add the phrase, "This message is unsolicited commercial E-mail" to the body of their E-mail ad.

But Steve Dougherty, director of Internet operations at EarthLink Network, Inc. in Pasadena, Calif., said searching the body of E-mail messages for those filtering tags would be like requesting your mail carrier to peek at your personal letters.

Searching for tags will meao more processing work for the service provider and will force the company to spend more on network maintenance, said Scott Chasin, chief technology officer at Colorado Springs-based USA.NET, a provider of Web-based E-mail to about 4.5 million subscribers.

"The bill doesn't address the real issue: Spam is clogging up the Internet," Chasin said. □

Mail moods

A poll conducted earlier this year indicates that a significant number of Internet users aren't sure that legislation is the way to handle unsolicited commercial E-mail, or spam.

Most of the more than 2,000 respondents to the survey by Esearch, a market research firm that collects data via E-mail, said they receive unsolicited E-mail occasionally or often.

When asked if the messages offended them, 77% of the respondents answered yes. But most of those who were offended also said they will read a piece of spam mail depending on the topic indicated in the header field.

"Spam is a hot topic, and despite the fact that people have strong opinions [about it], they are not acting consistently," said Janet Westergaard, president of Esearch in Rancho Palos Verdes, Calif.

Should there be some regulations on unsolicited E-mail?

Base: E-mail poll of 2,041 people; margin of error +/-2%

Source: Esearch, Rancho Palos Verdes, Calif.

Although most of the respondents indicated a strong dislike for unsolicited E-mail, 32% said it shouldn't be regulated, and 22% said they weren't sure if it should be. The remainder supported spam regulations.

The survey results indicate there is a point at which users will tolerate spam, she said, which may be important information for companies that use opt-in newsletters and mail lists to get information to customers.

But it is still a hard line for a marketer to draw. One company may send marketing messages occasionally, "but you can't control what others are doing," Westergaard said.

— Roberta Fusaro

New era in mobile connectivity begins today.

Xircom

NT 5.0 Beta 2 to ship this week

▸ *Microsoft works overtime to get late version out the door*

By Sharon Gaudin and Laura DiDio

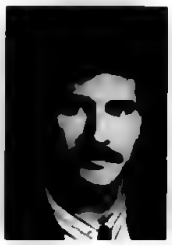
A DRAFT Microsoft press release dated Aug. 19 says the company will ship Beta 2 of its long-aoticipated Windows NT 5.0 operating system on Wednesday.

The release, provided to *Computerworld* by a source who was briefed by Microsoft, also says that in Beta 2, Microsoft and Hewlett-Packard Co. will "deliver standards-based Internet printing functionality" (the Internet Printing Protocol) for the workstation and server versions of NT 5.0. A Microsoft spokeswoman confirmed the printer plans.

Beta 2 originally was slated to ship in June but was postponed for further cleanup. Users are hoping the extra wait will produce a full slate of promised features and few bugs.

"The earlier beta performed poorly," said Thad Hymel, chief technologist for the Vision 2000 project at Hibernia National Bank in New Orleans. "And Microsoft has to do better because 30 million-plus lines of code means a lot of debugging if there are problems."

Mike Nash, Microsoft's director of marketing for NT Server and infrastructure products, said the NT 5.0 beta is "feature-complete and will incorporate everything we've promised customers, including the Active Directory and IntelliMirror." The IotelliMirror feature is especially crucial to businesses, because it gives them a "follow me" roaming capability that lets users log on from anywhere on the network and access their full configuration.



Hibernia National's Thad Hymel

But there are some key pieces of functionality in Beta 2 that aren't complete, Nash said.

Facilities such as Windows Terminal Server — also known as Hydra — "are in the [Beta 2] build," Nash said, "but we haven't turned on the interface to let all the beta testers use it." Instead, a smaller subset of customers will test Windows Terminal Server.

Other minor Windows NT 5.0 features that aren't yet complete include a software facility that is similar to the one in Windows 98 that lets users pull patches and updates off the World Wide Web and the hot docking capability.

After Beta 2 ships to 200,000 to 300,000 customers, Microsoft will fine tune some of it and finish issues such as Windows updates and new user tours, Nash said. Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., said Microsoft should use Beta 2 to show off all the features that it promised. □

Fleet data warehouse to go live

▸ *Complexity put project six months behind*

By Stewart Deck

SIX MONTHS after it had hoped to have its data warehouse project up and running, Fleet Financial Group, Inc. will begin using the system next month for targeted marketing campaigns.

Complexity delayed the $37 million project, said Randall Grossman, senior vice president and director of customer data management and analysis at Boston-based Fleet. "It wasn't that any one thing slowed us down — it just turned out to be a lot more work at each step along the way than we had anticipated," Grossman said.

"It just turned out to be a lot more work at each step along the way than we had anticipated." — Randall Grossman, Fleet Financial

The system will take customer and transaction data from 34 sources — including automated teller machines, telephone banking, deposits, loans and tovestments — and send it to a Sun Microsystems, Inc. staging server. The data is then standardized and loaded on to a pair of Sun 6000 servers running Informix Corp.'s Dynamic Server software.

Beginning next month, the warehouse will assist Fleet — the 10th largest bank io the U.S. — in its customer retention, marketing and cross-sales efforts. Grossman said if Fleet can keep just 2% more of its top customers from leaving, it will "be worth $20 million a year to us."

"For banks, there are three marketing objectives: acquire, retain and upsell," said Mitch Kramer, ao analyst at Patricia Seybold Group in Boston. "By consolidating the tons of customer information banks have, they cao ruo predictive modeling that can help the marketing like crazy."

Fleet's data warehouse has close to 350G bytes of data. That is expected to swell to 4T bytes in the next year. It will be used to hold three years' worth of customer and account-level data and 13 months of transaction-level data.

The project also includes two data marts and analysis tools from SAS Institute, Inc. in Cary, N.C., and Boston-based Exchange Applications, Inc.

By year's end, the system will have more than 150 users and could grow to as many as 2,000 bank analysts and possibly customer service staffers by the end of next year. "After 10 years of acquiring and consolidating [banks and other businesses], we began asking, 'How can we leverage this franchise that we've built?' " Grossman said. "This is a good way to begin." □

IBM spins off customer relationship products

By Jaikumar Vijayan

IBM'S CREATION OF an independent software company that will focus on customer relationship management products highlights the growing emphasis companies are placing on protecting and extending their relationships with customers.

IBM last week said it will spin off its entire customer relationship technology and services portfolio, as well as related products.

The products come from IBM's January acquisition of Software Artistry and the 1995 purchase of Early, Cloud & Co., both vendors of customer relationship management software.

An autonomous unit will allow IBM to better focus on the booming demand for customer relationship management products and services, said Linda Sanford, general manager of IBM's Global Industries group, which is creating the new company.

Market researcher Dataquest in San Jose, Calif., estimated that the U.S. market for such services will reach $2a billion per year by the end of this year and grow to nearly $3.5 billion by 2001 (see chart).

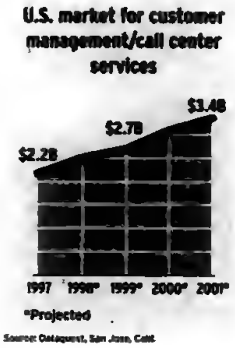
"It certainly makes us feel better about our decision," to buy customer relationship technology from Software Artistry about two years ago, said Marion Kolb, director of customer support services at Companion Technologies, Inc., a subsidiary of Blue Cross and Blue Shield of Columbia, S.C.

Customer relationship technology includes computer/telephony integration, and call center and sales force automation.

The company uses customer relationship management products to help its call center representatives handle service calls from customers around the country. "We now know for sure we are going to get the kind of service and support" they need going forward, Kolb said.

Customer relationship management technologies and services are aimed at helping corporations use informatioo gathered from various customer interactions — such as those via a toll-free number, help desk, support lines or the World Wide Web.

The technology includes computer-telephony integration and interactive voice-response products, call-center and sales force automation technologies as well as middleware and services for integrating and analyzing information gathered from customers. Major companies in this space include IBM, NCR Corp., Unisys Corp. and consulting firms such as Andersen Consulting LLP and KPMG Peat Marwick LLP.



MORE VALUE

Demand for those products and associated services is growing primarily because corporations are looking for new ways to add value to their customer relationships, said Frank C. Forest, a partner at Andersen in Dallas.

Computer/telephony integratioo products, for example, can allow call center staff at a bank to quickly pull up detailed customer account information from a central database and offer new services to a customer, even while resolving the particular call issue.

San Francisco-based software maker Indus International, Inc. uses customer relationship technology from Santa Clara, Calif.-based Vantive Corp. that helps the company capture data about a customer right from contact initiation. It lets Indus offer new services and upgrades while giving customers easier access to account information via the phone or the Web, said Teresa Smith, director of worldwide customer services.

"It has driven down our costs of supporting a customer and allowed us to monitor their needs better," Smith said. □

Share, Guide divvy up user market

By Jaikumar Vijayan

IT'S GOING TO BE a big iron melting pot in the capital this week.

For the first time in more than 30 years, two of the industry's oldest large systems user groups — Share and Guide International Corp. — will hold a joint technology conference melding the strengths of the two organizations.

The rosters of the groups — both based in Chicago — are filled largely with users from mainframe shops. Although Guide's focus traditionally has leaned toward management issues, Share has tended to focus more on technology.

Share President John Bevis says the show reflects growing member interest

Officials from both organizations said the combined show is a onetime deal designed to show each group's support for the other and give Guide members a preview of some of the changes that are being made to its organization and conferences.

Guide, like Share, traditionally holds its own conferences in the spring and fall. Despite the differing strengths of Guide and Share, the shows themselves have typically overlapped.

The joint conference will offer more sessions based on each group's strengths, sometimes dropping certain sessions and letting the other group take the lead in coordinating that presentation.

DIVIDE AND CONQUER

This week's event in Washington will mark the last "general" technical conference sponsored by Guide, according to President Ron Higgin. After that, Guide and Share will be "divvying up the market," with Guide shows solely focusing on information technology management areas — such as a License Use Management specification that it will preview at this week's show, to help users reduce software license costs.

One example of Guide's new focus is its next show in November called "Engage e-Commerce," which will focus on how organizations can leverage legacy applications to tap new electronic commerce opportunities.

Share shows will continue to focus largely on technology deployment and implementation issues. "The Guide and Share management teams believe this change will provide better overall coverage of information technology issues impacting the IT community we both serve," Higgin said.

This week's agenda also underscores the efforts both organizations are making to remain relevant to a mainframe member base that also has to deal with issues such as the year 2000, distributed computing technologies and fast-growing areas such as the Internet and Java-based computing.

Apart from the usual sessions oriented toward mainframe and midrange server technologies, for instance, the conference will have sessions focused on year 2000 issues and topics such as IBM's component broker technology, Enterprise JavaBeans.

"Share has always been an organization that reflects what is important to its members," said John Bevis, president of the 2,200-member organization and a manager at the University of Florida's Northeast Regional Data Center in Gainesville.

"It truly is a user group built upon the skills of our members. So as our members get involved in things like the Internet," that growing interest is bound to be reflected at the show, he said. □

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Washington state tries first antispam case

▸ *Lawsuit could evoke a hypercautious age of E-mail*

By Roberta Fusaro

IN WHAT may be the first real test of Washington state's recently enacted antispam law, the owner and three editors of an online newsletter called "TidBits" are suing an alleged spammer.

The antispam law prohibits sending messages that use a third party's domain name without permission or that contain fraudulent routing or subject-line information. The law is a straight liability statute that is now part of the state's Consumer Protection Act.

Seattle-based lawyer Brady R. Johnson on July 17 filed a lawsuit (*Engst v. Knight*) in King County Superior Court against WorldTouch Network, Inc. and the company's Los Angeles-based owner, Christopher Lee Knight. WorldTouch sells Bull's Eye Gold, a "spidering" software program that collects E-mail addresses and generates sales-related E-mail messages for the product.

AUGUST 24, 1998

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MANY COMPLAINTS

WorldTouch was at the center of numerous E-mail complaints made after the antispam law was passed, Johnson said. Adam C. Engst, owner of "TidBits" (*www.tidbits.com*), was among those who were tired of being spammed by WorldTouch. He and his staffers claim they received about 100 copies of Bull's Eye advertisements after the antispam law went into effect June 11.

Two of the plaintiffs each seek $500 per violation. Engst seeks $1,000 per violation. Total damages may approach $100,000, Johnson said. WorldTouch stopped sending spam on July 20, days after the suit was filed, he added.

The lawsuit, the first under the new law, is different from the well-publicized spam case that involved bulk E-mailer CyberPromotions and Internet provider EarthLink, Inc., said David Strom, president of David Strom, Inc., a messaging consultancy in Port Washington, N.Y.

The Washington state law is clearly and narrowly written, so the suit directly addresses the spamming issue, Strom noted. In the CyberPromotions case, more general laws regarding infringement rights were applied to Internet and E-mail issues.

ATTENTION GETTER

If "TidBits" wins its case, "users will have to pay attention to how they send mail to other states, no matter where they live," Strom said, noting that it could become a logistical nightmare. "On the other hand, we're all frustrated by floods of unsolicited E-mail that waste time, energy and bandwidth," he said.

Strom said the case also points to a wider problem: The lack of any body of law regarding the Internet and its use.

Knight is being served with court papers and a trial date is set for December, Johnson said.

In the past, Knight and WorldTouch have been thrown off numerous Internet services and have had many accounts closed down, Johnson said.

Computerworld left several messages at WorldTouch offices, but calls weren't returned.

A number of states and Congress are considering spam legislation.

Three other states — Colorado, Nevada and Maryland — have passed legislation, but none has teeth, Johnson said. He said the best of those three has an opt-out clause that says spammers can send E-mail until you tell them to stop. That doesn't address fraudulent E-mail headers and forged return addresses, he added.

Strong lobbying from groups such as the Direct Marketing Association and the American Civil Liberties Union have had great success in eviscerating some spam legislation, Johnson said. □

Vendors pump up support

▸ *CA, Cabletron to sell management services*

By Patrick Dryden

TWO MANAGEMENT software vendors are trying to build service organizations to boost revenue by helping IS managers cope with their complex platforms.

Computer Associates International, Inc. in Islandia, N.Y., acquired Realogic, Inc., a Cleveland-based integrator with 350 employees and revenue of $42 million, for an undisclosed price on Aug. 5.

Realogic is the first of many takeover targets of the Global Professional Services division, CA officials said. CA launched the division in April after it failed in its attempt to acquire a ready-made support organization by paying $9 billion for Computer Sciences Corp.

And last week, Cabletron Systems, Inc. in Rochester, N.H., introduced two services for users of its Spectrum network manager, repository and associated tools.

Cabletron engineers can remotely take over the maintenance of Spectrum servers to perform routine backups, updates and database tuning. They also can monitor network faults to free an information systems staff to pursue more important tasks.

Both CA and Cabletron are addressing "the ease-of-use issue — every big management platform is difficult to implement and maintain," said Stephen Elliot, an analyst at Cahners In-Stat Group in Newton, Mass.

However, users may not see immediate relief from these efforts, analysts said.

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In the security trenches

CONTINUED FROM PAGE 1

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"It's a struggle to keep on top of everything," said McKee, who has held his job for 15 years. "We're finding that some security technologies and products — such as router-based firewalls — are lagging behind the hackers."

Today's distributed client/server networks and the rise of the Internet, corporate intranets and extranets have made security an extensive task, McKee said. A decade ago, things were relatively simple: end-user terminals linked to mainframe hosts were state-of-the-art. "The corporate data was safe in the glass house," McKee said.

Nowadays, security management means overseeing a heterogeneous computing environment and opening up the enterprise to corporate customers and business partners. All of that keeps McKee and his staff — which includes 22 security administrators and four disaster recovery specialists — running hard to secure every potential portal into the firm's network. Firewalls and securing corporate E-mail are top concerns, along with the company's building of its first virtual private network (VPN). The rollout of the VPN represents a key business initiative.

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Besides playing a part in building new information technology projects at The Hartford, the security group also acts as the liaison for end users, setting and enforcing policies.

All new employees get copies of the security rules during orientation: Don't share your password or company ID; don't leave your PC unattended, and so on.

GET THE WORD OUT

The security team sends follow-up messages via "Frontline," the company's quarterly security newsletter, produced in conjunction with The Computer Security Institute, Inc. in San Francisco. McKee said the newsletter alerts users to common security threats such as virus hoaxes. "It gets them involved; many users come to us to warn us of potential problems," he said.

There is a lot of trust among security administrators; many have worked together for five to 10 years. Gary Lynch, an analyst at Gartner Group, Inc. in Stamford, Conn., said that is invaluable. "They know each other, they learn the ins and outs of the security setup, and they realize more quickly when something goes amiss," he said.

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Ron Solano, the security specialist in charge of firewalls, gets to work at 5:30 a.m. to handle user requests for access privileges and help-desk calls. He also tests current and new firewalls on pilot networks for one to three weeks before deploying them in a production network. Those early morning rituals are "a must" for The Hartford, Solano said, adding that "we can't let testing interrupt the workday."

Things are just as hectic for Emily Yen. As The Hartford's security specialist who monitors the Windows NT and Unix operating systems, she works closely with Mark Kulaga, who oversees the firm's use of digital certificates. One constant in Emily's workday: checking all the bug reports and alerts to find out about the latest security holes in NT and Unix.

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"We make sure we know our networks, our users, and we monitor ourselves to make sure we have all our security bases covered as much as is humanly possible," McKee said. □

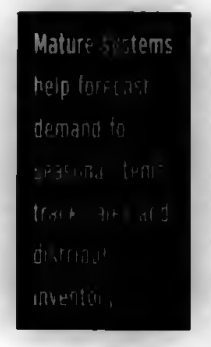
IS tries to stay cool during heat wave

▸ *Tracks product demand, protects systems*

By Patrick Dryden

INFORMATION SYSTEMS managers seem to be weathering this summer's record-breaking heat wave better than disasters such as tornadoes, floods and ice storms. After all, summer heat is expected.

It's business as usual for IS shops at big retailers such as J. C. Penney Co., Kmart Corp. and Sears, Roebuck and Co. Mature systems help buyers forecast demand for seasonal items, track sales and distribute inventory. That means hot customers won't lack fans, window air conditioners, radiator hoses and automobile coolant.



On the operations side, IS operators have to keep a sharp eye on heat levels in server rooms, communication centers and remote wiring closets. For example, they can remotely take the temperature of Compaq Computer Corp. servers by using Compaq's Insight Manager monitoring software.

But even extreme summer heat can strike anywhere and unexpectedly.

For example, IS managers at San Jose State University in California recently had to power down twice to minimal operation when their air-conditioning system couldn't keep up. Then they rolled in supplemental cooling units from MovinCool, Inc. in Long Beach, Calif.

In fact, so many computer and telecommunications sites have turned into hothouses during the heat wave that one MovinCool distributor, Russ Hiroto of Atlas Sales, Inc. in Oakland, Calif., said demand for his systems has jumped 40% in the past month. □

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Much of the South has been struck by record heat, which poses challenges to IS staffs.

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LANDesk upgrade spans all Pentiums

By April Jacobs

INTEL CORP. is advancing the capabilities of its LANDesk Client Manager software to give it the ability to manage all Pentium-based machines — not just those that comply with the Desktop Management Interface (DMI).

The latest version is shipping now to PC makers and is available on Intel's World Wide Web site. It includes a management agent that can poll firmware built in to all Pentium chip sets for basic information about hardware attributes, including operating systems, processors and hard drives. It also can perform more complex tasks such as checking to see if a system's memory is adequate.

The latest version of Client Manager extends manageability to any Pentium-based PC. Previous versions allowed only DMI-compliant machines to be managed — which basically meant that any hardware more than 18 months old didn't fit the bill. The ability to poll Pentium firmware for management information lets Intel address the huge installed base of non-DMI-compliant machines, while still pushing DMI compliance in newer hardware, analysts said.

But the suite's new capabilities still aren't the silver bullet for all desktop problems, such as incompatibility issues among operating systems, drivers and applications, said John Dunkle, president of Portsmouth, N.H.-based Workgroup Strategic Services, Inc.

Intel's LANDesk Client Manager:

- Works with Hewlett-Packard's OpenView, Tivoli's NetView and Computer Associates' Unicenter TNG
- Includes asset management and some remote troubleshooting

"Yes, it works well," he said, "but it's only as good as the least common denominator" — the capabilities of the hardware itself. Systems vendors have traditionally shipped management features with their machines, but without standard methods of sharing information.

Intel spearheaded both the DMI effort and the Wired For Management forum, a vendor-sponsored group working for interoperability. That action has led to better standardization among PC makers, especially in newer machines that support the latest version of DMI.

Users have always been eager for better systems management tools, particularly when trying to manage desktops and even servers from remote locations, an effort that can be costly and time-consuming.

"I don't know anybody who would not be interested in this kind of consistency throughout their network and desktops" and across different vendors' systems, said Lou Iozzi, a technology consultant at Wyeth Ayerst Laboratories, Inc. in St. Davids, Pa. "We are also looking into a product that can give us similar software management capabilities."

He added that his company has made managing its hardware easier by standardizing corporate desktops and servers on systems from Compaq Computer Corp. □

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Q&A

Ticketmaster's World Wide Web site, Ticketmaster Online, will use VRML to offer customers 3-D seating charts. That will let concert-goers and sports fans click on a seat and check out the view from that vantage point. Alan Citron, president of Ticketmaster Multimedia, answered some questions about the upcoming Web application.

Q: How will you use VRML?

A: We have a real specific project. Right now, we have a flat seating plan. But we want to give the customer a rich experience when they come to our site by showing them exactly what their seats are going to be like. It's very personalized.

Q: How long did this take you to plan?

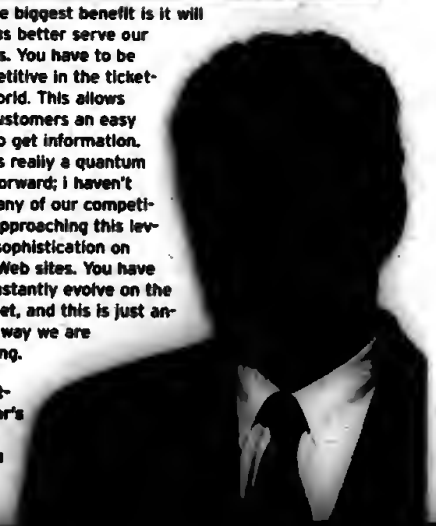
A: We started this one year ago. We essentially picked 80 venues for the first round, which we will go live with in mid-September. [On] Aug. 15, we'll have a preview so users can get a feel for this type of application.

Q: When will all the venues be online?

A: We're using the first 80 venues as the learning tool and then we'll do another round of venues. We have 3,000 to get up on the site. This is a learning experience, so who knows how long it could take to get all 3,000 online. The wise thing is to take this slow — see what works and what doesn't.

Q: What is the business benefit of the application?

A: The biggest benefit is it will help us better serve our clients. You have to be competitive in the ticketing world. This allows our customers an easy way to get information. This is really a quantum leap forward; I haven't seen any of our competitors approaching this level of sophistication on their Web sites. You have to constantly evolve on the Internet, and this is just another way we are evolving.



Ticketmaster's Alan Citron

VRML

DEFINITION: Virtual Reality Modeling Language (VRML) is used to develop three-dimensional images and scenes on the World Wide Web. VRML files are small, usually less than 1M byte. The small files let users interact with the scenes by moving "through" the image. For example, a user can "enter" a building and walk from room to room to see the building from every angle.

To make the best use of VRML, start thinking in 3-D

By Stefanie McCann

HAVE YOU EVER GONE to a Web site and drove a car around a racetrack or walked into a room that you could explore from all angles?

AT ISSUE

Are we ready for VRML?

If you have, you were most likely enjoying the benefits of Virtual Reality Modeling Language (VRML), used to create interactive, three-dimensional World Wide Web sites.

VRML allows 3-D images to be distributed over a network. VRML files are smaller than 1M byte, and most range from 100K to 200K bytes. Their petite size means they use much less bandwidth, making them easy to transmit.

Although VRML seems like a great idea, the world may not be ready for it. "People don't think in 3-D," says Mark Hardie, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Most people use their PCs to look at flat or two-dimensional images; users just don't see 3-D PC images very often in their daily lives.

Another reason people have been slow to adopt VRML is because most Web designers haven't begun to use it yet. Only about 100,000 people use VRML, according to Hardie, and that number isn't expected to grow until at least the year 2000.

Images created in VRML allow users to rotate, tilt and zoom in

COMPLEX PROCEDURE

Another impediment is that it's difficult to put 3-D images together compared with other types of Web technologies.

"If someone wants text, they type it in. If they want 2-D, they scan an image. With 3-D, there is modeling," says Wanda Meloni, an analyst at Tiburon, Calif.-based Jon Peddie Associates, an analyst firm that tracks 3-D and graphics technologies. Modeling is more difficult than scanning or typing because it involves using mathematical equations to create the 3-D image.

Image quality also is a problem with VRML. Three-dimensional images are made up of polygons — the higher the polygon count, the better the image quality.

Images from the movie *Toy Story*, for example, had a polygon count in the millions; VRML images typically have polygon counts in the tens of thousands, Hardie says.

VRML is making some strides, though. Ticketmaster Corp. is putting the finishing touches on 3-D seating maps for arenas and other venues for which it sells tickets (see Q&A at left). And a computer hardware company plans to render its PCs online in 3-D, according to officials at 3Name3D, a company in Marina Del Rey, Calif., that develops VRML applications.

The name of the hardware company must remain confidential for now, 3Name3D officials said, but the idea is to let customers go to the hardware vendor's Web site to find out, for example, exactly where a particular slot is for each peripheral.

The bottom line for VRML, Meloni says, is that there is "potential," but the technology is still "searching for its true identity." □

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to QuickStudy editor Stefanie McCann at* ***stefanie_mccann@cw.com***

OPINION

Disaster deja vu?

Some year 2000 doomsday specialists are having a field day with the monumental mess of the new, high-tech Hong Kong airport, which was staggered by computer system foul-ups last month. What they see is a sneak preview of the millennial havoc possible on Jan. 1, 2000.

At the very least, it was Murphy's Law at its most ferocious. Whatever could have gone wrong with this $20 billion behemoth project went wrong in spectacular fashion.

Hundreds of airplanes couldn't land on time, thousands of travelers lost luggage, escalators froze, toilets overflowed, perishable goods rotted in the broiling sun. The anguished Chinese government launched three different investigations as business damage ran into the hundreds of millions of dollars. The reputation of the world's busiest cargo-handling operation was left in ruins.

Only a week before the doomed opening of Hong Kong's Chep Lak Kok Airport, a smaller-scale debacle was unfurling in Kuala Lumpur, Malaysia, with the "high-tech gateway" airport at Sepang. Another much-hyped computer network — with 19 subsystems interlinked to handle everything from flight information to baggage control — also broke down. Chaos ensued.

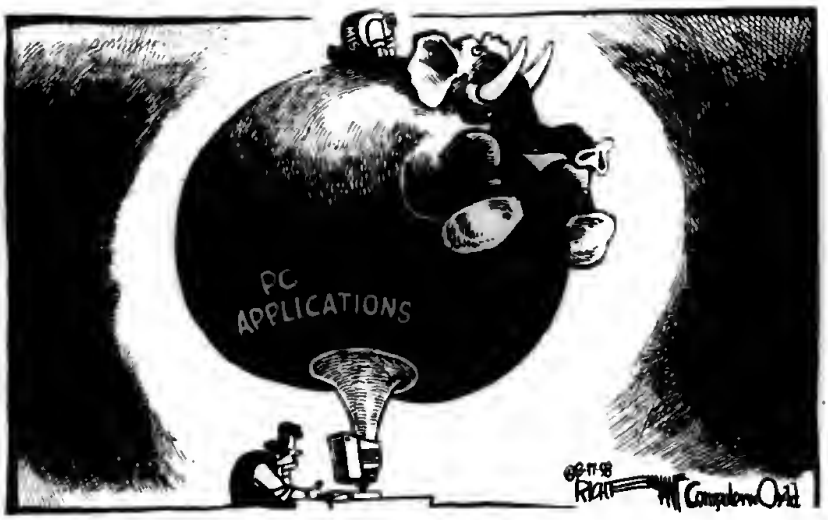
Are these incidents truly a disaster deja vu of year 2000's potential impact? Well, yes and no.

They certainly remind us all of the incredible interconnectedness of business computer systems and the damaging ripple effects when one fails. But more significantly, they underscore the crucial roles of testing and contingency planning (see "Testing: Every second counts," starting on page 49).

The Hong Kong airport was rushed to its not-so-grand opening before it was ready, largely for political reasons. The project managers who knew what could go wrong either were afraid to speak up or were simply ignored. The systems never had a chance against the human stupidity that forged ahead without backup plans or technology trial runs.

So if any of this reminds you of your company's year 2000 project, then heed the hard lessons of Chep Lak Kok: Test it, talk about it and take care of that vital connection between technology reality and business drivers.

Maryfran Johnson, *executive editor*
Internet: *maryfran_johnson@cw.com*



LETTERS

Year 2000 is good business

THE ARTICLE by Patrick Dryden "Millennium puts big projects on back burner" (CW, June 1) was concise yet excellent. Many organizations are only just waking up to what an enormous problem it is to convert all their software, hardware and procedures to deal with a new millennium.

Every aspect of each organization's database management systems, operating systems, purchased application packages and hardware will have to be reviewed, corrected, tested and reinstalled — all within a short time frame. The year 2000 issue provides a major incentive for organizations to re-engineer and rebuild old systems that run their business, rather than just patching them.

Jimmy Castro
Austin, Texas
jimmycastro@hotmail.com

The customer may be wrong

IN RESPONSE TO *Computerworld* columnist Paul Strassmann's article ("Quack software warranties have got to go," CW, July 6), allow me to truck out the tried-and-true computer/car analogy. The condition of most end-user machines is deplorable. If General Motors was expected to provide warranty service because the owner decided to remove the oil because a friend told him it would run better, you'd probably see the same extreme backlash out of GM.

While I agree with Strassmann in general, I think he failed to mention a critical aspect of the situation. The typical end user understands the word "support" to mean "free 24-by-7 training over the telephone." That would be like assuming the dealership will teach you to drive and later on will happily walk you through purging your fuel system when your 8-year-old fills the tank of your car with pool water.

> The condition of end-user machines is deplorable

Software is extremely complex and expected to operate in a wide range of completely unique runtime environments. It's unrealistic to simply say, "Make better software." Nobody in their right mind assumes GM purposely designed exploding fuel tanks into their pickup trucks several years ago, yet it happened. I don't like the thick legal jargon of modern software licenses either, but I also don't like the incredible nonsense the producers of software are expected to swallow on a daily basis. There are plenty of days when you users out there look every bit as menacing, unforgiving, disrespectful and totally insensitive as any faceless software industry giant.

Jon McGuire
Advanced Computing Environments
Merrill Lynch & Co.
Orange Park, Fla.

Millennial success is simply a question of attitude

I READ with interest your article on the electric industry ("Power outage?" CW, July 6) because I am a systems administrator for a rural electric cooperative. You say that among other utilities, rural electric cooperatives are "behind the curve," being "constrained by finances and a lack of personnel to examine their year 2000 problems."

It is unfair to make a blanket statement like this. I have met with colleagues from several other "smaller" utilities regarding the Y2K problem and have found their reactions to be consistent with any other group of companies. The opinions range from a few who think there is no problem to those who think the world is about to end. But the majority of us believe there will be some impact and are taking steps to minimize it.

We have been working on the Y2K problem for more than two years and have it under control as much as possible. As a "smaller" utility, we can react more quickly than the giant mega-utilities. Most smaller utilities do not generate their own power, but purchase it from a large supplier. We get our power from the Bonneville Power Association, which has been working on Y2K for several years.

I think that readiness for Y2K depends not so much on the size of your staff as on how seriously you take the problem.

Art Malin
Systems administrator
Kootenai Electric Cooperative, Inc.
Hayden, Idaho

***Computerworld* welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; internet: letters@cw.com. Please include an address and phone number for verification.**

How to solve the contingency planning problem

William Ulrich

A Cap Gemini study found that between April and July, the percentage of companies performing contingency planning increased from 3% to 72%. That means companies now realize their best efforts can't eliminate all year 2000 problems.

Their concerns are supported by recent code audits that uncovered dozens of fatal year 2000 errors in systems that had already undergone remediation and testing. Coupling those findings with concerns about supply-chain continuity and embedded system reliability provides management with more than enough justification for creating year 2000 contingency plans.

Year 2000 plans must be centrally coordinated, yet highly distributed.

With little time left until those plans will be invoked, companies must quickly solidify contingency plans for business units and technical teams. But the planning process is moving slowly, and it typically doesn't incorporate the full spectrum of contingency issues required at most companies. Working through that process for the first time is difficult, because enterprisewide contingency planning isn't intuitive. One financial institution described contingency planning as a "tail-chasing" exercise.

The reason for the confusion is that contingency planning is nonlinear; it can't be performed by a single task force or business unit. For management to initiate a contingency planning project, it must recognize and incorporate two key sets of deliverables: the bottom-up, tactical piece of the plan and the top-down, business-driven component.

At some companies, project teams already are performing bottom-up contingency planning. That process assesses the tactical impacts of a system problem, project overrun, data interface error or supply-chain interruption. Bottom-up planning ensures that tactical backup plans are in place in case a localized year 2000 failure occurs. But such planning does not, in and of itself, consider business-driven priorities, revenue continuity, enterprise planning or the ripple effect of a system or supply-chain failure.

To ensure strategic operational continuity, contingency plans must include a top-down, business-driven view of the problem. That requires executive sponsorship, business unit mobilization, distributed facilitation sessions, functional criticality analysis, failure impact and probability analysis, and secondary impact analysis.

As risks are uncovered, analysts must assess contingency options and the cost of each option. The cost of fixing a problem may not be justified — which could nullify certain bottom-up contingency plans. A planning team should take ownership of telecommunication, utility and other enterprise-level contingency plans so that business unit analysts can focus on core business functions.

Integrating top-down and bottom-up contingency plans is essential in assessing the ripple effect of a failure and in assessing failure probabilities for those functions. That step links business functions to dependent functions and to the systems, interfaces and suppliers that support those functions. An integrated view of the contingency model lets teams encapsulate invocation strategies for related business functions and the systems or suppliers that triggered the failure.

Companies are just launching contingency planning projects. A top-down, bottom-up strategy incorporates the integrated view needed to insulate organizations against a catastrophic domino effect of a year 2000 failure. □

Ulrich is president of Tactical Strategy Group, Inc. and executive vice president of Triaxsys Research LLP. He is co-author of The Year 2000 Software Crisis: Challenge of the Century *and* The Year 2000 Software Crisis: The Continuing Challenge. *His Internet address is tsginc@cruzio.com.*

Portable non-PCs: Annoying and coming fast

John Gantz

It's mosquito season again in New England, and I've been thinking about small, buzzing things that are annoying. How about all those gadgets and devices that are starting to talk to the Internet? You know: screen phones, smart handheld devices, WebTV — even new types of video games.

I wouldn't normally bring this up, because I long ago exhausted the topic in these pages by writing about the special perils of managing fleets of mobile computers, which get a lot worse when the devices fit in a coat pocket. They almost cost more to inventory and manage than you paid for them. By now you know how hard it is to keep track of those things, prove their worth, manage upgrades and so on.

UBIQUITOUS

What's got me thinking now is the idea that so many of those devices will be on the Internet. And they will be accessing (among others) the marketing, commerce, data warehousing and other line-of-business applications that businesses will increasingly offer from their Web sites. Which, in turn, will connect to corporate computers.

In fact, according to International Data Corp. (IDC) forecasts, by 2001, more than 40% of the devices shipped that connect to the Internet will be something other than PCs. By then, consumers will be buying more information appliances than PCs.

Sure, you won't have to manage them if, in fact, they're just more consumer gadgets. But you *will* have to accommodate them on your Web site. Wells Fargo & Co., for one, learned some tough lessons about frames, Java applets and larger-format screen displays in its Internet home-banking foray; for many customers, those devices made its Web site unusable.

Rule 1 in accommodating traffic from these devices: Optimize your site for the lowest common denominator. The IDC data indicates that, as non-PCs take hold, that denominator will go even lower. But that's not the only problem. As we automate our customers, more of those nameless consumers will access our corporate systems — and ask us why things don't work.

It took a support specialist at American Airlines' Web site 20 minutes on the phone with me to discover that I couldn't log on to my AAdvantage account because I had the wrong date set in my computer. The system was timing out, and the cookies couldn't go back and forth, or something like that. But shouldn't this guy be fixing year 2000 code instead of talking to a casual user like me?

Your Web site will soon have to accommodate all of these devices.

The increasing mobility of these devices also will keep us hopping. Now, portable items account for less than 20% of the installed base of devices we have to manage, support or send data and Web pages to. In five years, portable items will account for 50%.

Try troubleshooting that. Try capacity planning. Try staffing a help desk. Even try finding out which devices are the most common so you can optimize your applications.

The combination of devices, configurations, communications options, operating systems and browsers will grow by an order of magnitude. But those portable devices *will* be here — they're too handy to simply dismiss. We must make room for them in the IT tent.

Who knows? If we get good at dealing with them, maybe we'll gain some competitive advantage. □

Gantz is senior vice president at IDC in Framingham, Mass. His Internet address is jgantz@idcresearch.com.

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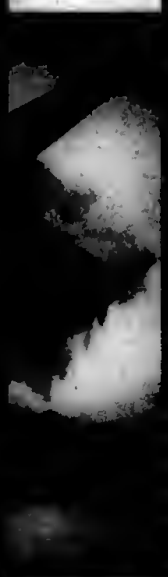

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PLATINUM TECHNOLOGY

Linux edges into the IT mainstream

Dan Gillmor

I first met Linus Torvalds, founder of the Linux operating system, a little more than two years ago. I was in Finland, reporting on that tiny nation's remarkable technology community and its achievements, when I visited him at his small flat in Helsinki.

For someone who'd sparked a software mini-revolution, Torvalds was unassuming — a far cry from the egomania I frequently encounter in Silicon Valley (see our interview with Torvalds on page 43). Linux, a freeware variant of Unix, had made quiet-but-genuine inroads into the computing world. But Torvalds clearly understood that while his central role was important, even essential, the project depended on the legions of programmers and users elsewhere who were determined to make it work.

From humble beginnings, it's become a rock-solid operating system that can handle critical chores.

Much has changed since then. For one thing, Torvalds has moved to Silicon Valley. For another, the impact of Linux has surged. It's emerging as a rational alternative to Windows NT and other major enterprise operating systems. That acceptance, combined with the IT community's fears of a Microsoft-only world, has prompted heavies such as Oracle, Computer Associates, Netscape and Informix to port some products to Linux. Those vendors aren't just playing to the anti-Microsoft crowd, but are recognizing that Linux has become a rock-solid system that can handle mission-critical chores.

Linux has a small-but-growing number of mainstream desktop applications. StarOffice, from Europe's Star Division, is an impressive package. Corel claims it's porting its WordPerfect suite to Linux, too. But don't hold your breath for Microsoft Office for Linux.

Enterprises are exploring Linux, and they like what they're finding. They're learning what webmasters and Internet jockeys already knew: Freeware — now called "open-source" software — is more than a cheap alternative to commercial products. In some ways, it's the equal of anything else out there; in others, it may actually be superior. The Internet as we know it depends to a large degree not just on Linux, but also on freeware packages such as BIND, Apache, sendmail and Perl.

The failings of Linux are becoming less awful as time goes on. It wasn't long ago that the only way to use Linux was to install it yourself. Now a few hardware OEMs have discovered a market for computers with Linux preinstalled.

Even installing Linux is getting easier, though not nearly easy enough for anyone outside the IT-tweaker community. Hardware drivers are improving in variety and quality, but it's still much too easy to encounter major problems.

Linux isn't the only freeware Unix variant. FreeBSD, a popular Unix alternative, comes with full source code. Sun is letting individuals use Solaris, though not its source code, without charge. And the Santa Cruz Operation provides SCO Unixware, for personal and nonprofit use only, also without source code.

One of IT's big questions about Linux is support: Who gets the call when something goes wrong? Linux companies such as Red Hat and Caldera are improving their support, and third-party help is more available. The Internet is still the main avenue of help — and the 'net-based community of Linux developers has proved astoundingly efficient in finding and fixing problems.

While the Linux world has changed enormously in the past several years, some things stayed the same. Torvalds is still a nice guy. And the project he started as a Helsinki university student remains in the hands of his worldwide force of collaborators and — more importantly — in the hands of users. □

Gillmor is technology columnist at the San Jose Mercury News. *His Internet address is dgillmor@sjmercury.com.*

Of managed care, angry politicians and the Web

David Moschella

As the debate rages about whether Congress should enact some sort of patients' bill of rights, Managed Care has joined Big Tobacco as a favored punching bag of pundits and politicians.

Certainly, there are few policy issues that so easily hold the public's attention, and the health care industry will always generate a stream of infuriating anecdotes. Overall, it's hard to imagine an easier target than companies trying to a make a profit off the sick.

But before those in our profession decide to join in the latest round of rock throwing, we might want to consider that managed care and the health care industry's use of advanced information technology are likely to be inextricably linked. Indeed, if you believe — as I do — that the Internet and the Web offer vast new potential for improved, more cost-effective health care services, then you don't want to be too quick to argue that the shift to managed care should be reversed.

To see why, let's briefly step back in time. Before managed care became the dominant model, the U.S. health care business was characterized by an even more unwieldy bureaucracy of insurers, health care providers, government agencies and employee benefit programs. When coupled with a serious lack of financial incentives, industry inertia and a proliferation of incompatible technologies, that structural complexity made the exchange of health care information extraordinarily cumbersome and inefficient.

Thus far, the managed care revolution hasn't done all that much to change this. However, at least theoretically, it might someday do so. By more closely integrating the insurance and health care functions, it is laying the groundwork for the time when consumers and employers can directly interact with online health care offerings. Sometime, somewhere in the not-too-distant future, consumers will be able to view and compare health care plans online and will be able to easily see which doctors are part of which networks. More important, consumers will be able to interact with their providers — while also rating and evaluating them. Information on particular ailments, as well as related support or discussion groups, will be a few clicks away. No hospital or insurance company could easily do this on its own, but an integrated managed care provider could — and likely will.

The Web is an awesome platform for delivering health care services. It can eliminate mountains of easily outdated forms and manuals, it can be customized to focus on individuals' needs, and it can provide in-depth information that brochures never will. It also has built-in privacy that will encourage consumers to really understand their needs.

Advanced IT will soon drive vast improvements in a much-maligned industry.

Perhaps best of all, it is interactive — not just from insurer to consumer but also from patient to doctor and patient to patient. That heightened flow of communication forms the most promising path forward.

Of course, many will say that similar services could be more simply and quickly delivered through some sort of national health care system, and perhaps the Canadians or the Europeans will prove that is so. However, because it seems clear that the U.S., for the time being at least, has chosen not to pursue a government-driven solution, managed care is really the only game in town. From a technology perspective, this looks much more promising than today's rhetoric would suggest. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. *His Internet address is dmoschella@earthlink.net.*

Corporate Strategies

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WHAT VACATION?

Although most of us would trade work for sun and fun, a lot of us just can't seem to leave the office behind:

75% Call the office while on vacation

71% Check telephone messages

60% Receive phone calls or E-mail from the office

54% Work while on vacation

24% Take laptops on vacation

Base: Survey of 622 executives at U.S. companies; multiple responses allowed

Source: Roper Starch Worldwide, Inc., New York

Topping a trillion

Information technology worldwide revenue surpassed the $1 trillion mark last year, according to the Information Technology Industry Council. Of the $1.027 trillion, $804 billion was from U.S. industry.

Marriott IS purchase

Marriott International, Inc. in Washington has purchased a $2,000-seat license to run Cary, N.C.-based Tangram Enterprise Solutions, Inc.'s Asset Insight software to track and manage inventory of the hotel company's workstations, servers, bridges and other hardware. Terms of the agreement weren't disclosed.

Do you want cookies with that?

Job hunters should do well if they can build a corporate site on the World Wide Web. Salaries for employees with such talents rose an average of 10.1% this year. That's because the Web can generate revenue — the number of companies with sales sites leaped to 36.2% so far this year, compared with 13.5% last year.

Source: Buck Consultants, Inc., New York

Nice if you can get it: a telecommute

By Barb Cole-Gomolski

BEING A UNIX and C programmer worked for Christine Finlayson until she started a family.

With the children, now ages 3 and 1, "I wanted to work less but still stay in the IS field," Finlayson said.

That's a great option — if you can get it, recruiters said.

According to the U.S. Bureau of Labor Statistics, more than 21 million people now work at home at least part-time. However, the full-time information systems job that can be done from home is still rare.

"We don't get many client [companies] that are willing to [offer full-time telecommuting]," said Chuck Miller, a principal at AJM Professional Services, an IS recruiting firm in Troy, Mich. "If you have the kind of job where you work independently or you have a highly specialized skill, you're more likely to be able to negotiate a work-at-home deal," Miller said.

At Penn Mutual Life Insurance Co. in Horsham, Pa., only one or two of the company's 150 IS professionals work from

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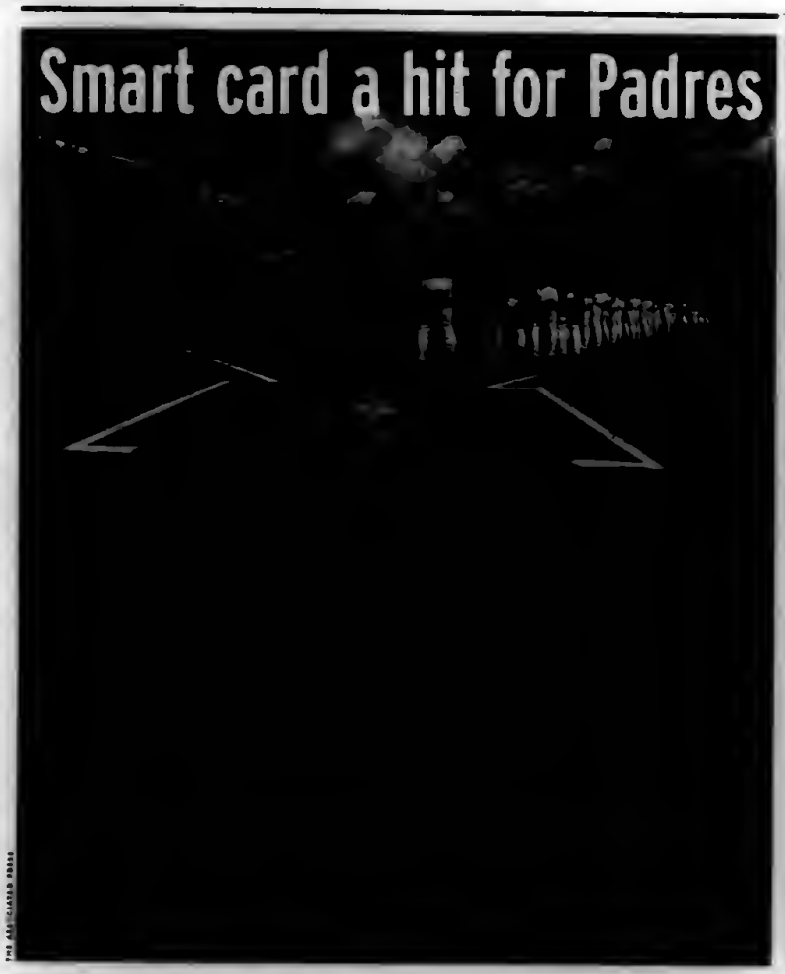

THE ASSOCIATED PRESS

How profitable is that bank customer?

▸ *Data warehouses help banks target those with highest profit potential*

By Thomas Hoffman

FOR YEARS, banks have tried with mixed success to measure customer profitability.

While they were able to get a 50,000-foot view of how profitable their products and customers were overall, the information "wasn't precise," said Bill Bradway, an analyst at Meridien Research, Inc., a Newton, Mass.-based financial services research firm.

But in the past two years, more sophisticated software, faster servers and greater storage capacity has made it possible for institutions to measure transaction costs for each customer.

Measuring how much a customer's cash machine withdrawal costs a bank "is a very powerful capability, but it's very hard to do for millions of accounts," Bradway said.

Consider that the first step is extracting data from dozens of disparate banking systems, such as mortgage loan and checking systems. That data must then be scrubbed and organized to deliver a customer-centric view. That leads to political and technical challenges for many banks whose business divisions have historically been separated from one another, analysts said.

But those challenges haven't stopped banks from launching assaults against the 80/20 rule, which states that 20% of customers typically deliver 80% of a bank's profits.

Estimated global spending on products that forecast profitability of customers

Base: Survey of 500 companies worldwide

Source: Meridien Research, Inc., Newton, Mass.

For example, Compass Bank in Birmingham, Ala., is in the process of building a customer information data warehouse to track the costs of 25 million customer transactions per month across 2 million accounts, said Scott Wise, a vice president of customer profitability at the bank, which has $14.5 billion in assets.

The warehouse, which Compass Bank is building with help from ASI Financial Services, Inc. in New York, also will work with an activity-based cost accounting system called Oros, from ABC Technologies, Inc. in Beaverton, Ore.

"The more historical data we

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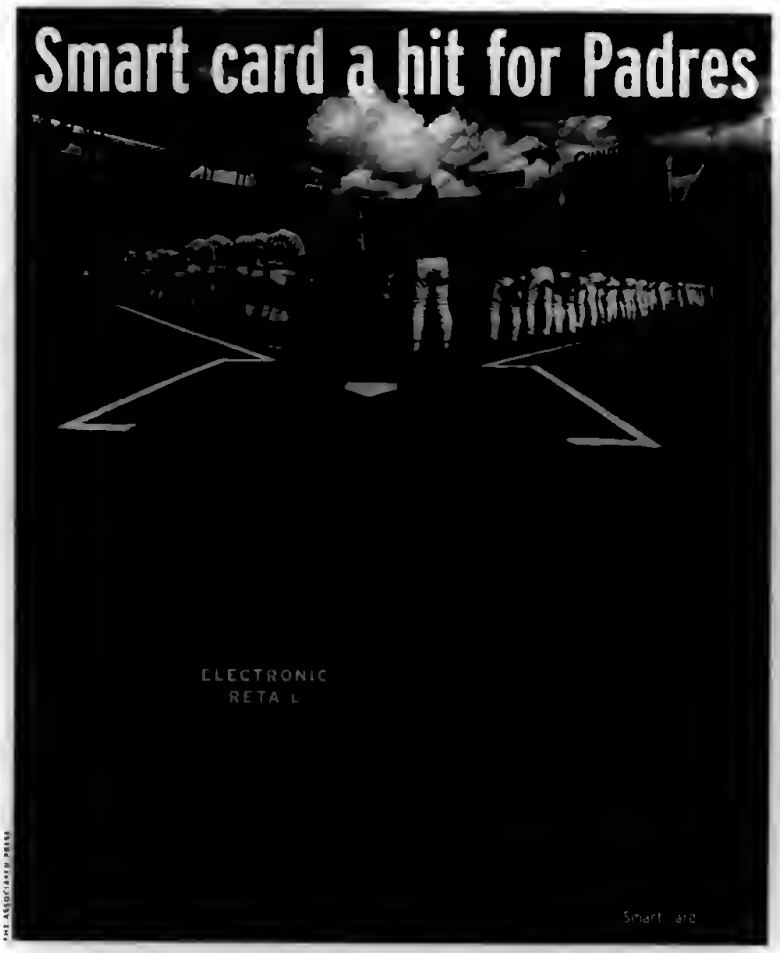

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Outsourcing viewed negatively

By Patrick Thibodeau

INFOSMATION TECHNOLOGY outsourcing deals are often rocky, with users complaining more than half the time about service levels, unexpected costs and dissatisfaction with vendor personnel, according to a survey of Fortune 1,000 companies by Gordon & Glickson PC, a Chicago-based law firm that focuses on high technology.

Of the 85 companies with sales of more than $2.5 billion that responded to the survey, 54% reported that their outsourcing relationships had gone "severely awry." The problems ranged from employees who feel that their jobs are at risk to snafus when determining service levels, said Barry D. Weiss, a general partner at the firm.

Companies that are good at running IT departments as a stand-alone business may not have problems with an outsourcer and "probably don't need to outsource in the first place," Weiss said. "[But] a lot of times, an outsourcer will come in [to a situation] where you've got a certain amount of disarray or not as much clarity about what is being delivered."

"Anytime there is a change of any significance, it's going to cause problems," said Paul Johnston, an analyst at International Data Corp. in Framingham, Mass.

Despite the potential problems, a majority of companies believe outsourcers can deliver improved services, Johnston said. For those companies that can't keep up with the IT skills shortage and technology changes, "outsourcing will be the right alternative," he added. □

Banks

CONTINUED FROM PAGE 31

get [into the warehouse], the more predictive modeling we can do," Wise said. In this case, Compass Bank plans to use predictive modeling to determine whether a customer holds long-term profit potential.

Wise placed the bank's return-on-investment goals at four to 10 times its seven-figure investment and implementation costs.

Yet building a warehouse isn't the only way to pursue these goals. Banks are looking to integrated software suites such as SAP America, Inc.'s to avoid the hassle of joining disparate back-office systems.

SAP ALTERNATIVE

Three years ago, SGZ-Bank AG in Frankfurt began to look for a profitability measurement system with asset liability and risk management features, said Detlev Nitsche, chief controller at SGZ.

It wasn't until SAP introduced profitability modules in the spring that SGZ was able "to fulfill all of our requirements in one application," Nitsche said.

UMB Bank in Kansas City, Mo., looked into other profitability systems before deciding on SAP because it wanted a package that could handle other financial functions such as accounting and general ledger, said Patrick Ruckh, a senior vice president at the bank, which has $7 billion in assets.

UMB's intent is to get more "wallet share" and "build tighter relationships" with its customers, in part by heavily marketing more profitable products, Ruckh said. He placed the project's costs at less than $2 million and said the bank expects a return on its investments within two years. □

Smart card a hit for Padres

CONTINUED FROM PAGE 31

Fans can buy the cards at booths set up at the stadium. The Padres also sent a free $5 card to all season ticket holders.

"We tried to create a new and unique program to enhance our fans' experience at the ballpark," said Cheryl Smith of the Padres' marketing group.

And the Padres have seen sales of souvenir baseballs, batting gloves, jackets and other souvenirs jump 15% during the past season. Cardholders can use the stored-value cards at any of the Padres outlets in the stadium or at an official Padres souvenir store in Encinatas, Calif., which is about 30 miles away.

What differentiates the Padres cards from other retail-oriented electronic debit programs is that information about cash value is stored on the card itself — in the chip.

"This means there's no need to place a call to an issuer for value verification. There's no need for phone lines to get authorization," said Sondra Wolfe, the project's manager and a principal at Beacon Financial Group, a financial services product development company in Carlisle, Pa., which is part of the program.

Instead, the Padres and Service America upload data from the stadium's 48 terminals just once each night to Beacon's host computer, which calculates how much the Padres and Service America are owed for purchases made with the cards. Beacon then electronically transmits the reconciled amounts to the two companies.

Now, a little more than four months into the season, only about 3.5% of food and beer purchases are being made with the card, according to Wilson.

But to realize cost savings, that figure needs to increase significantly, he said.

"Right now, I have 10 to 15 vault people counting money at a game. That's about a three- to five-hour process," Wilson said.

"But if card sales get to account for 30% to 40% of sales, then it would be a 10-minute transaction to upload information from the terminals to the bank and have them wire the money to my account," he said. That, in turn, would eliminate the need for cash counters and reduce the time it takes for money to hit his company's account.

But veteran industry expert Jack Nilon, whose company, Nilon Brothers, Inc., operated concessions at Philadelphia's Veterans Stadium for 15 years, is skeptical.

"There's no substitute for cash. This is a gimmick," Nilon said. "And let's say they did get to the point where they were doing 70% of their business with a [cash] card. Make no mistake. It won't be long before the bank is going to want to charge for those transactions just like the credit-card companies do." □

Snapshot

Year 2000 plans are slipping

78%	of companies are missing year 2000 project milestones
97%	haven't done any contingency planning
85%	underestimated year 2000 costs
92%	haven't defined business accountability for year 2000 initiatives

Base: Study of more than 1,600 companies

Source: Meta Group Inc., Stamford, Conn.

Nice if you can get it

CONTINUED FROM PAGE 31

home, according to Sue Kozik, vice president and chief technology officer. "We find that flextime works better for most people."

TEAM SPIRIT

That might be because of the teamwork IS projects require.

"It's very difficult to accomplish that without going eyeball to eyeball," said Tom Samson, president of Technology Exchange Networks, Inc., a Coppell, Texas, IS consultancy.

Yet some sectors of the technology field lend themselves to telecommuting.

HighTech Connect, a Pleasanton, Calif.-based network of professionals that do contract work for high-tech companies, billed $250,000 in its first six months of business. The company, which was started early last year, now has about 400 marketers, technical writers and product release specialists available for hire. About 85% of them are women with young children.

Rene Siegel, co-founder of HighTech Connect, said the best opportunities for remote workers in the computer industry are in areas such as programming and public relations because "they involve having your head buried in your keyboard or attached to a phone."

Finlayson wasn't interested in juggling the pressures of an IS management job. In April, she took a contract job at Betasphere, Inc., a start-up in Palo Alto, Calif., that manages software and hardware beta programs for industry heavyweights such as Cisco Systems, Inc. and Sun Microsystems, Inc. Finlayson puts in about 25 hours per week from her home in Redmond, Wash. About half of Betasphere's employees telecommute, according to company officials.

"Their ad said 'telecommuting OK,' and you don't see that very often."
– Heidi Collins
Betasphere

ESSENTIAL BALANCE

Although her job is less technical than her old IS position — she spends her time collecting feedback from beta testers and reporting back to Betasphere's clients — Finlayson said the job let's her "stay connected in the industry and have a better balance between work and home."

One of Finlayson's colleagues, Heidi Collins, looked to Betasphere for work following a move to a remote area of California where there wasn't a lot of job opportunities.

"Their ad said 'telecommuting OK,' and you don't see that very often," Collins said. Working from her home in Murphys, Calif., has improved her quality of life, she added. "I exercise more."

And that oftentimes is the point. "In the beginning, telecommuting was about keeping employees happy," said Glenn Lovelace, a former director of telecommuting at Nortel, Inc. Lovelace, who now runs a systems integration firm in Austin, Texas, that specializes in setting up telecommuters, said that over time, Nortel saw the clear business benefits to the arrangement.

At Nortel, employee surveys showed that "productivity was higher and [turnover] was lower among those who telecommuted," he said. □

ALLIANCES

Customers can rely on certified VARs for Sun expertise

"It's important that [VARs] are certified and well-trained to best serve the customer."

Masood Jabbar, president of Sun Microsystems

SUN MICROSYSTEMS EXPECTS A LOT FROM ITS RESELLERS. EVERY SUN VAR MUST HAVE the expertise to deploy and maintain every facet of a customer's computing environment.

That's why Sun requires that its VARs go through its Competency Certification program. A Sun VAR that finishes this training is certified at one of three levels: Workgroup Computing, Enterprise Computing or Specialty. A reseller who doesn't finish the program is finished as a Sun VAR. It's that simple.

Certification guarantees a potential customer that a Sun reseller has the expertise to support Sun installations in pure or heterogeneous cotoputing environments, and that the reseller fully understands Sun technology and how it can be applied to best meet the customer's needs.

Currently overseeing the certification program is Masood Jabbar, a 12-year company veteran who became president of Sun Microsystems in February. Jabbar believes that resellers are crucial to Sun's success. "We built this company on the premise that we will always treat our VARs as an extension of our organization," he says. "They represent Sun, and they solve very complex issues. It's important that they are certified and well-trained to best serve the customer."

In addition to customers, the program also benefits Sun and its resellers by serving as a key to healthy channel management, as well as working to reduce grey marketing and the distribution of product without value-added services.

Every one of Sun's approximately 600 VARs in the U.S. has made a significant investment in the program. Not only have they sent their key people through the program to achieve initial certification, they also must continue to take education credits annually to maintain their Competency Certification.

VARs who complete the Workgroup Computing Certification are trained to configure and maintain Sun's Desktop and Workgroup server product lines and to construct network solutions tailored to a customer's business. They can also help with hardware and software support, or upgrade a customer's installed base.

Enterprise Computing-certified resellers have a command of large storage systems and client-server applications. They can size, configure, install and support departmental and data center server solutions. Enterprise Elite resellers have made an extra commitment in training additional technical support personnel on Sun technology.

Specialty Certification is offered in areas such as E10000 enterprise server, A7000 storage server and, of course, Java. "We've fully engaged our VARs to take Java to market as a platform," says Jabbar. "We have to have more Channel Java Computing Services providers. This is key to our strategy."

To further address the needs of customers with heterogeneous environments, Sun recently added an NT interoperability component to its certification program. "Our customers have integrated environments, and I don't want VARs to ignore NT," says Jabbar. "We will interoperate with NT. SunLink 1.0 is out now to support that."

Jabbar wants to see the concept of Sun Certification grow. "If anything," he vows, "I will make the certification program even more prevalent, so that all out employees are fully certified and fully trained in everything that Sun offers."

AC TECHNOLOGY, INC

AC TECHNOLOGY, INC
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AC Technology, Inc., started in 1991 as a reseller focused on systems integration whose mission was to develop Unix-based turnkey solutions for government, financial, telecom and commercial customers.

Today the company is a Sun reseller certified at the Enterprise Elite level. It sells the full line of Sun workstations, servers, mass storage systems, software and services. The company also has Specialty Certification in Java computing, Sun clustering and E10000.

This reseller offers a team with a staff average of more than 12 years' experience in complex hardware and software integration, ruggedized information systems, legacy conversions to Sun platforms, server and database migration, RAID design and implementation, high availability and parallel database installations, and network management.

AC Technology performs site surveys and analysis, systems and network capacity planning, server sizing and blueprinting, network design and implementation, RAID design and implementation, Internet and intranet design, system and network security, and design and implementation of network operations centers.

The company also produces ruggedized custom rack mount and deployable solutions, which are often used by the military. "Our deployable Sun workstations and servers are built to withstand the extreme conditions of combat areas," says executive vice president Arthur Sands. "We are currently completing the design and implementation of the first deployable E10000."

INTERVIEW

ARTHUR SANDS
EXECUTIVE VICE PRESIDENT

Q *Why is a VAR's certification so important to a potential customer?*

A If the customer is going to commit to Sun for an enterprise solution, the VAR providing that solution should be just as committed to Sun as the customer. Certification means the VAR can not only sell a solution but also support it completely. If the VAR doesn't understand all the technology, then they're not providing a total solution.

Q *Have you closed any deals because of your certification?*

A We recently completed an installation at the U.S. branch of a cell telephone company that's going into the ISP services business. The company is a large Sun customer in Europe, but a new company in the U.S. and they didn't have technical support here.

They wanted a Sun server, but they needed someone with a background in both Oracle and Cisco to provide a turnkey solution. Sun recommended us as a VAR because we could provide the total package, including service.

Q *What is the biggest concern of your customers today?*

A That whatever they buy today can be obsolete tomorrow. At the enterprise level, when you invest in technology, you need to look at planning for the future. At this time, Sun has the best growth plan because with Solaris, the same software runs on all their desktops and servers. You can start with a small server or workstation and go all the way up the upgrade path to the E10000. All the software you wrote for that server will still run. And when you want to move up, your software investment moves with you. It's like getting a built-in technology refresh.

Q *Are you doing anything with Java?*

A Mostly on the professional services side. We develop server applets for clients. They all have Java engines. But because we spend more time at the enterprise level than at the application level, we don't really concentrate on Java.

Java is evolving as an application language. It's very easy to work with on any system, including Unix, NT, etc. We'll see the services side of the business grow as Java applications become more widely accepted.

AISG

ADVANCED INFORMATION SYSTEMS GROUP, INC.
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(407) 774-7181 Home page www.aisg.com

Advanced Information Systems Group, Inc., (AISG) is a reseller focused on integrating enterprise solutions, including security, interoperability, and infrastructure solutions for IS workgroups. These infrastructure solutions include networking, Internet/intranet and operating systems services.

The company sells to both the government and commercial marketplaces. While most of its business is derived from the commercial sector, the company is also approved as a government VAR for Sun.

Founded in 1991, AISG has been a Sun VAR for four years. With 75 employees and some $15 million in 1997 revenue, AISG ranked #33 on *Inc.* magazine's annual list of the top 500 privately held companies in the United States.

AISG is Sun-certified at the Enterprise Elite level. The company maintains a staff of Sun Competency-certified experts in areas such as systems and network administration, systems performance analysis, systems security, help desk design, remote systems administration, systems and application installation, operating systems migration and project management.

"Our customers are making a bigger investment in the enterprise solution," says Kevin Jackson, founder and president of AISG. "Because this is a mission-critical area, our certification is important to them. The customer is keenly aware of these areas, and the certification is a true differentiator because it shows that we have the required expertise in the Sun world."

AISG is Java-certified, and offers Java design, development and training. "We see ourselves growing in that arena, and we expect to be adding more consultants there," says Jackson. The company is currently building two Java-based applications: a telephony application and a kiosk application.

INTERVIEW WITH

KEVIN JACKSON
PRESIDENT

Q. Why is a VAR's certification so important to a potential customer?

A. Certification differentiates us from non-certified, non-qualified VARs that are out there selling systems. This is very important to the user. It separates us from the competition, and to the customer it is an assurance that we really know the product.

Q. Have you closed any deals based on the expertise you received from certification?

A. One deal involved providing a reservation system for a large family entertainment company. The customer needed to know that we maintained a close relationship with the manufacturer. Our certification provided that.

Q. What is the biggest concern of your customers today?

A. Whether their next move will be NT or Unix. We're assisting a lot of those companies in rightsizing the best solution to their platform. Interoperability is really important here, especially in integrating NT and Unix.

Q. What's been the biggest change in your business in the past 12 months?

A. We've noticed a huge shift to Unix servers. Companies are embracing Unix. We've also seen a higher degree of NT being used, so you have to justify the move to a mixed solution, especially at the lower end of the workgroup market.

Q. What do you see as the main benefits of using Sun technology to support heterogeneous environments?

A. Sun products are very integratable. Their interoperability is almost unprecedented.

CENTRAL DESIGN SYSTEMS

CENTRAL DESIGN SYSTEMS, INC.
1705 Wyatt Drive
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(408) 327-9800 Home page: www.cendes.com

Central Design Systems, Inc. was founded in 1994 as a Unix reseller with a focus on systems administration. Today the company delivers Sun mission-critical solutions (including network design; enterprise, departmental and workgroup servers; and remote systems administration tools) to companies ranging from chip designers and other manufacturers to financial institutions, telecommunications utilities, retail outlets and Internet service providers.

The company is authorized and certified by Sun to sell all of its Enterprise and Workgroup Computing lines. Central Design has also achieved Sun certification in security, high availability, Internet and intranets, and maintains Sun core competencies in high-end servers, enterprise networking, application tools and professional services. These services include installation and integration of various applications, web authoring and customer training.

Central Design focuses exclusively on Sun Microsystems. "Sun is tried and true," says Eric Hughes, vice president of marketing. "Customers who made that move to NT are now saying that in the short run NT may look cheaper, but in the end it is more expensive. They're finding that they've painted themselves into a corner with NT."

Earlier this year, Central Design sold its Wyatt River Software spin-off, a provider of Java-based license and asset management tools. However, the company is still interested in pursuing the Java tools market, and is looking for new technology to acquire, particularly "Java solutions for the systems administration world," says company president Bill Ames.

INTERVIEW WITH

BILL AMES
PRESIDENT

Q *Why is a VAR's certification so important to a potential customer?*

A It's important that the customer gets quality service that's been approved. Certification sets us ahead of the competition. It shows that the bar has been set.

Q *Can you tell us about a deal you closed based on your certification?*

A I can tell you about the time certification almost wasn't enough. A recruiting firm came to us who already had a web page, but the system was slow and the company was losing valuable information. They were looking for a company to do all of its backup and systems analysis.

They had already tried one VAR, who had positioned itself as authorized and certified. But the recruiting firm soon unfortunately discovered that the VAR was sorely lacking in the necessary expertise. So now the customer had an "I'm from Missouri" attitude. To this company, being certified no longer meant that much. Just to win the project, we had to clear the hurdles that previous reseller's lack of experience had caused. We had to go above and beyond to prove ourselves to the company.

Then, of course, we had to make sure the system worked better than the customer could have hoped. But we were able to do that. We did all the necessary analysis, then implemented a new system, and new backup. I guess you could say that true certification won out in the end.

Q *What is the biggest concern of your customers today?*

A The need to be always up and running. Even a day of waiting is a problem. These companies need the fastest tools possible. Their turnaround time is nine months, so there is a new product out every nine months. In that environment, you really can feel even a day or two of downtime.

Q *What are the main benefits of using Sun technology to support heterogeneous environments?*

A That Sun has always had an open computing belief. Sun makes everything play well together. That sounds like mother and apple pie, but it really works.

CONTINENTAL RESOURCES, INC.

RESOURCES, INC.
Turnpike
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Home page: www.conres.com

Resources, Inc., is a reseller focused on systems integration, particularly in heterogeneous environments. The company also offers expertise in network design and implementation, systems management (including applications such as scheduling, storage management, performance monitoring, tuning and tuning.

company has a number of Sun Competency-level specialties, including StarFire 10000, cluster-high availability and parallel database, and is certified to sell the entire Sun line, from desktop clients to enterprise servers. The company is certified at the Workgroup and Enterprise levels.

Resources offers a suite of solutions for Internet/intranet model, including the Netra internet server product, the Web server, Netscape proxy, firewall solutions, encryption systems, and digital encryption and anti-hijacking products.

company has started to provide enterprise resource planning (ERP) solutions, through a combination of products from Informix, Oracle, SAP and Sun. Because of the nature of the heterogeneous environments, Resources also provides PC-based systems.

the company's focus is the integration of disparate environments. "We recognize the need for having a mixed environment in our customer base," notes president Jim McCann. "We can help with migration."

company also does upgrades, which "is a very active market for Sun and resellers," says "The customer may not realize it but their platforms may be obsolete. We try to let the know that the technology has changed, and may be a faster, more cost-effective solution and without it the ability to grow their company be compromised."

INTERVIEW WITH

JIM McCANN

PRESIDENT

Q. *Why is a VAR's certification so important to a potential customer?*

A It's the guarantee to the customer that we know what we're doing. The customer is investing a lot of money to get the most support, and needs to know that it's a safe bet.

Q. *Have you closed a deal based on your certification?*

A We had a customer that brought in a deal that involved Sun, SAP and another vendor. This was a critical application, so it needed high availability and a backup solution. The project also needed to be on time and on budget. So they had to be absolutely sure that the solution they would get was the right one, and our certification assured that.

Q. *What is the biggest concern of your customers today?*

A: The ability to integrate heterogeneous environments. Most customers have mixed environments, and it's a big challenge for them to integrate all this into one whole that operates seamlessly.

Q. *What's been the biggest challenge for your business in the last 12 months?*

A: The big challenge is getting the right people. Because of the explosive growth of Unix as a solution, there has been a sharp increase in demand for services, and sometimes outsourcing. Companies with a shortage of people can't devote their people to these issues, and some staffs have had to shift duties to their Year 2000 concerns.

Q: *What is the main benefit of using Sun technology to support heterogeneous environments?*

A Scalability. Most of what Sun designs is very modular. Say you buy an E3000. There are slots in the chassis, and everything in the I/O board is completely interchangeable. You can grow your server. There is also binary code compatibility, so you can run on the E6000. Your investment is still there. This is a great financial benefit to the customer. We tell customers this is a "happy" problem. It means their business is growing great guns.

Dynamic Systems, Inc.

SYSTEMS, INC.
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Home page: www.dynasys.com

in 1991 by Chuck Stygar and Mardi Norman, Systems, Inc., has evolved from a seller of to an integration and networking specialist that on Unix solutions for government agencies and contractors.

Services offered by the company include systems and integration, configuration of servers and workand Internet set-up and design. The company offers custom Total Solutions Packages in the areas intranet and extranet security; system pertuning; data management; storage manageand high availability.

The company also specializes in EDI JIT, a solution will help government agencies and contractors with the mandate to be online with EDI by the "Our customers' interest is in having the to move, manage, and protect their data," says vice president Norman.

Systems is Sun Competency-certified at level. The company has Specialty in Java computing, SPARC Storage Array PC, and is currently developing a Java-configuration tool, notes Norman.

The company is also a certified reseller of network software, including Sun's SunScreen SKIP and Security Manager, Solstice-Firewall-1, Solaris, NFS Security and Solstice SPF-2000. integration team provides customers with hardand implementation assistance to a smooth, heterogeneous environment in their The company also has a certified electroroom (ESD) environment "which to protect our customers' investment when we and configuration work on their high- and servers," says Norman.

INTERVIEW WITH

MARDI NORMAN
VICE PRESIDENT

Q. *Why is a VAR's certification so important to a potential customer?*

A. Our customers want to know that the people working on their solutions are qualified. Being a certified VAR proves to them that we have the capabilities to perform the tasks that they require us to do. We are just like any other profession; there are standards that we need to hold ourselves to. You wouldn't hire a lawyer that hasn't passed the bar, and you wouldn't have a doctor operate on you if that doctor wasn't a qualified surgeon.

Q. *Have you closed a deal based on your certification?*

A. On a project where we were competing with another reseller, we supplied our salespeople with all of our certificates to show where we were certified. This customer wasn't extremely familiar with the certification program, so we had to educate them. We ended up doing a fax blitz, sending all of our certifications to them. It impressed them to no end. That our staff had gone through complete certification was a real feather in our cap.

One part of our training that addressed this customer's needs was Volume Manager, which we had Sun Certification in. The other reseller couldn't say they had the certifications that we had.

Q. *What is the biggest concern of your customers today?*

A. Customers must manage and control large amounts of data and secure or protect their intranets and extranets. We provide these solutions by moving, managing and protecting their data through our custom Total Solutions Packages.

Q. *What's been the biggest change in your business in the last 12 months?*

A. Winning a large EDI JIT contract with an aerospace firm. The federal government has mandated EDI JIT procurement by the year 2000. This is expected to greatly reduce paperwork. An individual will be able to use EDI JIT to order a product they need via EDI. Everything will be automated, including warehouse inventory. The product will ship in three days.

While manufacturers have been using EDI for some time with their distributors, now we're addressing the end-user side. The manufacturer, reseller and end user will be tied together. This completes the chain.

Peripheral Vision InfoSystems

VISION INFOSYSTEMS, INC.
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7535 Home page: www.pvi.com

Vision InfoSystems, Inc., (PVI) was founded to deliver enterprise solutions to Fortune 1500 . Today it specializes in network and enter- computing, custom Java applications and , Internet, intranet and extranet access and database and data center development, and systems. PVI leverages a company's existing to design and implement the network.
company is certified at Sun's Enterprise Elite which it carries several certifications, including 10000, Java computing, SunService, high , parallel database and Netra, and will soon its storage certification. PVI was also recently to be a Sun training center in areas such as Java, Unix and Netscape Server.
uses Java extensively. In building the third tier, Java in conjunction with application servers. "By in the third tier, you can pull information database with business logic, middleware tools, and put it through a Web server and then it on a browser," says Kane.
also uses Java for terminal replacement. "A lot are running aging applications on minis," . "Our focus is to get tid of the high mainte- PCs and dumb terminals that don't have func- and put in Sun Servers and JavaStations.
a lot of benefits in this: more speed, TCP/IP ew security model.
old mainframes and minis are just used to data. You can retain the same user interface, new functionality, like e-mail, calendaring and , for a very small price. You get a huge in productivity, you save big bucks in adminis- and you can control everything centrally."

INTERVIEW WITH

SCOT KANE
PRESIDENT & CEO

Q. Why is a VAR's certification so important to a potential customer?

A. The phenomenon of open systems scares a lot of people. Certification gives the customer confidence in the full solution, which is 30% technology and 70% applying it. They also know that the manufacturer endorses us and that we have that level of proficiency.

Q: Has certification helped you close a deal recently?

A. A major greeting card company was looking to move their mainframe data, which encompassed applications like order entry and sales, out to 300 client stores. This required training 12 of their IT staff members to become architect integrators. We had the certification to do that. We put them on a 12-week program. They had no knowledge of Unix or Java. We taught them things like naming services, TCP/IP, HTML, firewalls, all the fundamentals of open computing. Then we provided a series of Java classes. They ended up with an internal architecting group that can do integration, and can use the newer Java tools.

We won that account because of our certification. We didn't just sell them equipment, we sold them our knowledge, training and consulting. We showed them how to apply the technology.

Q. What is the biggest concern of your customers today?

A: The need to support an open world. The biggest concern is "how to get there." Everyone is trying to figure out what the components are. But the real problem will be how to re-engineer their processes to move the company with the technology changes.

The networked world changes the boundaries within an organization. You're integrating the past, applications of the proprietary world, into today's open model. Allowing for this integration will allow companies to get closer to their customers and partners. They will need central control and administration.

Q. What are the main benefits of Sun technology?

A: The benefits revolve around reliability, availability, serviceability and scalability. I can put in a solution, scale it without having to rip out the architecture or changing the underlying business logic.

SOLID SYSTEMS, INC.
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[illegible], Texas 77040
[illegible] 934-9494 Home page: www.solidsystems.com

Solid Systems, Inc., was founded in 1983. Today the [illegible] provides enterprise solutions for Fortune [illegible] businesses, government agencies and educational [illegible]tutions. These solutions include network design and management, Internet/intranet integration, data center migration, high availability and fault tolerance, [illegible] backup, retrieval and storage, and disaster recovery. [illegible] company claims particular expertise in the areas of enterprise-wide data management, network integration and storage management.

Solid Systems is Sun Competency-certified and [illegible]-certified. The company sells the entire Sun [illegible]. "We've invested heavily in Sun's vision, because it's [illegible] with our vision for the future," says CEO [illegible] Cruise.

To meet the needs and business objectives of its [illegible]mers, Solid Systems provides contract professional [illegible] and network services for Unix, Novell and [illegible] NT users. The company offers training at its [illegible]ning facility in Houston or at the customer's site.

"Our mission is to provide a high degree of techni[illegible] expertise for our customers," says Cruise. "We must always be up to date from a technology standpoint."

INTERVIEW WITH

BILL CRUISE
CEO

Q *Why is a VAR's certification so important to a potential customer?*

A Certification ensures our customers that they are working with a company that can provide the best technical expertise. Sun's certification gives visibility to the fact that we are involved with the most current technology.

Q *Have you closed a deal based on your certification?*

A Under Sun's Competency certification program we have the E10000 specialty, Sun's largest system. That has allowed us to close several million dollar deals. Without that specialty, those deals wouldn't have been available to us. We were able to provide up front information that helped these customers make a decision based on the knowledge we had. We were very involved in the pre-sales decision-making process, the implementation and ongoing support.

Q *What is the biggest concern of your customers today?*

A Our customers are faced with many competing solutions to address their business problems. Making the right decision about those solutions offered to them is perhaps the most significant concern they're faced with.

Q *Do you see your business evolving because of Java?*

A Yes. We have already qualified for the Java Computing specialty, as well as other specialties. We see it as extremely important and that's why we've invested heavily in this Java certification. In the future, Sun will be the lead technology provider because of their investment in Java. We're already investing in that vision.

SOUTHERN OFFICE EQUIPMENT
4424 N. Lois Avenue
Tampa, Florida 33614
(813) 873-1112 Home page www.soffice.com

Southern Office Equipment is a reseller offering total solutions systems integration with a focus on networks. According to company president and founder Joanne Miller, that means "not just simply knowing how to hook up the network. It includes third-party integration, working with multiple operating systems, extending past multi-file sharing and printing, and making use of all the software available."

The company was originally formed by Miller in 1989 to sell PCs from Digital Equipment Corp. to state and local government. But less than six months later, she saw that her company needed to provide a full solution and she began evaluating vendors of mid-range systems.

The company made the switch to Sun Microsystems two years ago, partly because, Miller says, she "found a huge interest in Sun within my customer base. Once I talked with Sun, I found that their philosophies were very much in line with my own."

Southern Office Equipment has been ranked among Florida's Fast Track 25 by the *Tampa Bay Business Journal* for three years in a row. Miller attributes this to her company's philosophy of focusing on the customer, and determining how a solution will work best for the customer.

To get to that point requires cooperation from the vendor. "I started out in the business when channel-friendly was a foreign word," she says. "Working with the other vendors was like pulling teeth. It all comes down to the same issue: The manufacturer must have a good relationship with the customer. Sun has that."

Certified at the Enterprise level, the company, says Miller, "offers state and local government guaranteed services backed by a vendor who invests in education and technology." The company is also certified in Java computing; Java, she says, plays a key role in her company's work in network computing and the Internet.

INTERVIEW WITH

JOANNE MILLER
PRESIDENT

Q *Why is a VAR's certification so important to a potential customer?*

A Any city or county department that provides services has to be sure their systems are always up and running. If not, you'll hear about it on the news. They must have fault tolerance and high availability. You have to provide people with disaster recovery, especially here in Florida with the unpredictability of hurricanes and tornadoes.

Without certification, there would be no proof that people are going to give you a verifiable working solution. There are a lot of box pushers out there. A person might not really be capable of delivering a solution.

Q *Have you closed a deal based on your certification?*

A Yes, with a water management department that would not even entertain any VAR that was not fully certified. They could not afford to get stuck with poor service or equipment they can't maintain. They have to be up 100% of the time, even through flooding. Customers must always have fresh water.

In the past, when they dealt with non-certified vendors, they were left with solutions that didn't work. They bought from us because they needed Sun Competency certification.

Q *What is the biggest concern of your customers today?*

A Scalability. State and local government need to know they're buying something that will last. Their biggest fear is they haven't spent taxpayer dollars prudently and wisely. They can't be upgrading in two years. They need to know they're buying something that will last and grow with their needs.

Q *What changes do you foresee for your business?*

A We plan to become certified in Sun/NT integration. We're thrilled to see the addition to the training schedule of integration of Windows NT with Solaris. There are still many legacy systems that must utilize all of the resources in an organization, including Novell and NT. We can't go to our state and local governments and ignore that they have NT in there.

TACTICS, INC.
1800 Century Blvd., Suite 1450
Atlanta, Georgia 30345
(404) 248-1226 Home page www.tacticsus.com

Founded in 1993, Tactics, Inc. today positions itself as a reseller offering systems integration and consulting services, specializing in Oracle Corp.'s database, tools and packaged applications. "We focus on the database solution more so than on the software/hardware solution," says CEO Dewey Blaylock.

"We are able to use that database expertise to bring in the software and hardware products and the systems engineering expertise to the customer," says Blaylock. "They find one company that is able to bring them the full, integrated solution." But Tactics is also Sun Competency-certified at the Enterprise level, with E10000, A7000 and data warehouse certifications.

The company's major lines of business include electronic commerce, application development, data warehousing systems, database administration services and mobile solutions. Its expertise includes design and implementation of client/server and web-based custom software applications; remote 24x7 operations center support; and the design of web-based solutions coupled with corporate databases.

Tactics utilizes its own implementation technology, involving the client with prototyping for better user understanding of functionality and support upon implementation. Web-based developers bring extensive experience in Java-based applications. On-site user training is also offered.

The company is growing fast. In 1997, the number of employees reached 190, up from 125 in 1996. Revenue grew from $17 million at year-end 1996 to $25 million last year.

INTERVIEW WITH

DEWEY BLAYLOCK
CEO

Q *Why is a VAR's certification so important to a potential customer?*

A Certification is as important to us as it is to our customer base. We want to ensure that we are providing qualified services. One way I have of ensuring that is investing in certification. It also addresses the issue of us being a smaller company. Certification puts us on a compatibility scale of what they would expect from a company like Sun.

Q *Have you closed any deals based on your certification?*

A There have been many specific cases. Because we have certification we can represent ourselves as a very high-end solutions provider of enterprise services. It's obvious to the customer when we close the deal that we know what we're talking about.

Q *What is the biggest concern of your customers?*

A How to conduct business in a full electronic-commerce environment. They need to know how to collect employee information from remote locations, accept orders from customers electronically, and allow them to check the status of an order electronically. This involves a distributed business environment focus.

Q *What do you see as the main benefits of using Sun technology to support heterogeneous environments?*

A Sun is the leader in giving the customer—business information systems managers—the ability to have open systems. Java technology is truly designed to run anywhere. That combined with Oracle's Network Computing Architecture allows you to distribute processing anywhere. We can combine these to allow processes to be as efficient as possible.

Q *What are you doing with Java?*

A We're developing applets and integrating that with what we're doing with the Oracle database to provide an applications layer.

VCSI

VISUAL COMPUTING SOLUTIONS, INC.
90 Executive Drive
Carmel, Indiana 46032
(317) 814-8274 Home page: www.vcsihome.com

Visual Computing Solutions, Inc., (VCSI) provides solutions in the areas of data warehousing, data mining, systems management and integration, Java development, and network computing.

According to VCSI president Richmond Wells, Sun certification has been a boon to his company. "When a customer sees that you have this competency, they recognize the value in that," he says. "I can make a strong case for having those plaques on the wall that say we're certified. It definitely helps sales, and it has allowed us to attract and retain some of the top people out there because they really want to work for us."

VCSI's philosophy is to establish a long-term relationship with the customer, and to achieve that, the company does not charge on front-end consulting. "The customer sees our competency up front, and the value that we add," says Wells. "The sale typically comes to fruition."

A Sun Competency-certified Enterprise Elite reseller, VCSI specializes in the E10000, and is authorized to sell all Sun products and services, from desktop JavaStations to mass storage devices to Enterprise servers.

VCSI has also invested heavily in Java technology. "A high-tech integration firm without a focus on Java would be as silly as GM and Ford not being concerned about the future technology of tires," says Wells. "There's a lot of interest in Java from our customers. Companies are finding that they can significantly minimize software R&D by writing in Java code. Clients have us doing Java development for them now."

INTERVIEW WITH

RICHMOND WELLS

PRESIDENT

Q: *Why is a VAR's certification so important to a potential customer?*

A: It indicates that the VAR and the vendor are committed to each other. It shows we have invested in our people, from a training perspective, to meet customer needs. The customer can feel more comfortable because they know that we know what we're doing.

Q: *And how has certification helped VCSI?*

A: Certification has been a key factor in almost every procurement we're involved in. Recently, we established an account relationship with a public utility. Not a lot of Sun VARs were willing to bid on that project because they knew they didn't have the technical competency required. But we invested a great deal of time doing a proof-of-concept with the customer. Because we had invested that time up front, the customer saw that we were adding serious value to the sale.

Q: *What is the biggest concern of your customers today?*

A: They are looking for technology business partnerships. The overall investment in technology is still expensive, and people costs are not decreasing. Some firms are growing, but they don't justify the cost of support staffs. An entire re-evolution of the architecture—the thin-client architecture—is emerging. Companies need a relationship with a partner that can make that work. We come in to be that partner.

Q: *What's been the biggest change in your business lately?*

A: E-commerce. There's a $200 billion market opening up over the next 18 months. A barrier of that market's growing is trust, meaning that individuals have yet to understand enough about the Internet. Once they have that trust, they'll be doing more and more on the Internet.

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Internet Commerce

Electronic Commerce • The World Wide Web • Intranets

Briefs

U.S. companies that use the Internet to advertise jobs and seek talent

1998	70%
1997	51%

Base: 407 HR managers

Source: American Management Association, New York

Lycos buys service

Major Internet portal site Lycos, Inc. in Waltham, Mass., has inked a $93 million stock deal to acquire WhoWhere, Inc. in Mountain View, Calif., a World Wide Web directory service. WhoWhere also includes MailCity E-mail services with 9.3 million registered users and the Angelfire home-page publishing site.

Peapod expanding

Internet grocer Peapod, Inc. said it plans a nationwide grocery service that will handle nonperishable goods. The Skokie, Ill., company offers home delivery of groceries, including fresh meats and vegetables, in about a half-dozen metropolitan areas. The nationwide "Peapod Packages" of dry goods is intended to build brand recognition before the company expands its full service to more markets.

EPA Web site

The U.S. Environmental Protection Agency has launched a Web site that lets users search its environmental database by ZIP code. The Center for Environmental Information and Statistics site, at www.epa.gov/enpi/, includes data on environmental conditions and hazardous waste sites.

Private membership

Fluke Software in Santa Monica, Calif., has announced AuthentiX Version 4, software that manages membership areas for Microsoft Corp.'s Internet Information Server. It lets users create fee-based or cookie-free private membership Web site areas that keep Windows NT user names and passwords private. It costs $995.

Web operation reaps unexpected profit

▸ *Thomas Cook launched money-changing site to save money, but ended up with a moneymaker*

By Sharon Machlis

WHEN THOMAS COOK LTD. Financial Services launched a Web site for its business customers early last year, executives were divided over whether it would help the bottom line.

Those expecting substantial savings were wrong. But the site nevertheless is expected to contribute 10% to 15% of the division's total profits this year, according to John David Telford, senior vice president of corporate foreign exchange in Toronto.

UPDATE
WHATEVER HAPPENED TO:
Thomas Cook's currency exchange site

"It's not [a major benefit] from a cost savings perspective. It's from a revenue-generating perspective," Telford said. "More businesses are choosing to deal with Thomas Cook. . . . If we knew then what we know today, we would have done it sooner and in a much bigger way."

The site, at *www.fx4business.com*, allows companies to make foreign exchange payments, such as to suppliers or merchants overseas, via the World Wide Web. For some business users, that can mean substantial time savings from conducting those transactions over the phone or in person at a local bank.

"It saves us time, it saves us money," said Priscilla Gosselin, treasurer at Simon Pearce, a Windsor, Vt., seller of handblown glassware and pottery in the Northeast.

It is faster to submit data on a Web form than to call in the information over the phone, Gosselin said. In addition, the company knows immediately how much an electronic transaction will cost because it uses that day's foreign exchange rate. When Simon Pearce requested paper checks for European vendors over the phone, the final cost wasn't known until the day

Profits, page 35

Microsoft: Back-door hack no threat to cautious users

By Laura DiDio

THREE WEEKS AFTER a hacker group released a program that it claimed compromises Windows 95 and 98 security, Microsoft contends that users who practice safe computing are not at risk.

So far, the company hasn't received any complaints that companies' networks have been hacked by the so-called "Back Orifice" utility, according to a Microsoft Corp. spokesman. However, security experts said that in the wrong hands or at a company with lax security practices, Back Orifice can be a particularly nasty hack.

Back Orifice became widely known at the Black Hat '98 and Defcon briefings in Las Vegas earlier this month. At that time, its authors, the Cult of the Dead Cow (CDC), a self-described hacker group formed in 1984, released the self-installing utility, which lets users remotely control Windows 95 and 98 computers. Since that time, the group said, more than 35,000 people have downloaded the utility from its World Wide Web site.

"Back Orifice can be potentially brutal," said Mark Fabro, director of Secure Computing Corp.'s risk assessment group in Toronto, which sponsored Black Hat and Defcon. "Knowledgeable, hard-to-impress secu-

Microsoft, page 35

Free mail doesn't cut it for business users

By Roberta Fusaro

FREE MAIL SERVICES from various Internet sites make messages as accessible as the closest Internet browser at an airport kiosk or cybercafe.

It's cheap, low-maintenance and users don't need to lug around heavy laptops. Sign-up is a snap.

So why don't more businesses want to switch from complex proprietary messaging systems on the desktop to Internet-based mail accounts for their staffs?

Many free mail systems are a prime target of direct marketers and bulk E-mailers, making them a breeding ground for spam. And the services aren't as feature-rich as packaged groupware systems such as Lotus Notes, Microsoft Exchange and Novell GroupWise.

GroupWise users at the Sundance Resort in Provo, Utah, would never switch totally to free mail, said Gary T. Hilton, a senior consultant at the Hilton Technology Group, which han-

Free mail, page 35

World Wide Wait

The average time, in seconds, to download a home page from one of 40 business-related Web sites during business hours for the week of Aug. 3, 1998:

Top 5 best-performing Web sites	
AltaVista	7.44
Yahoo	8.00
Merrill Lynch	8.61
Sprint	8.63
Oracle	10.09

Best areas to surf	
Boston	9.93
Pittsburgh	10.20
Miami	10.92
Worst areas to surf	
Norfolk, Va.	32.50
Tampa, Fla.	25.64
Columbus, Ohio	25.16

Source: Keynote Systems, Inc., San Mateo, Calif.

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Computerworld judges the innovativeness and creativity of the promotions of Sun resellers throughout the industry and rewards the resellers who create effective campaigns that communicate the end-user benefits of Sun Certification. For more information on the winning resellers, please see Sun's Alliance Supplement in this issue of *Computerworld*.

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Unexpected profits

CONTINUED FROM PAGE 33

those checks arrived.

At first glance, it would seem that moving the transactions onto the Web would cut personnel costs. However, the company wanted to retain personal contact with customers, so its foreign exchange dealers continue to keep in regular touch with their accounts.

Many companies embarking on electronic-commerce initiatives continue to focus on slashing personnel costs, not understanding that the Web can be an entirely new sales channel to exploit, said Roy Satterthwaite, an analyst at Gartner Group, Inc. in Stamford, Conn. An 18-month-old Web site delivering up to 15% of a division's profits is "pretty impressive," he said.

Growth was slow initially, in part because the company's sales force had to understand how to pitch the service to current and prospective clients.

"Looking back on it, it's a pretty big transition for a person to make, going into a fairly conservative client base," Telford said. "It probably does take a good bit of education of the sales force."

Thomas Cook's foreign exchange Web revenue doubled between February 1997, when the site first went up, and the end of that year, and growth has quickened in 1998, Telford said. (The privately held company doesn't disclose specific revenue or profit figures.)

The company redesigned the site last month, adding a more spreadsheet-like interface for users and general foreign exchange news.

Telford said he estimates that 75% of the orders taken on the Web site in July represented new business.

"As a group, we were split as to whether or not this would take off," Telford said. "I don't think we're split anymore." □

MORE ONLINE

Visit *Computerworld online* to read our original story about Thomas Cook's currency exchange Web site.

www.computerworld.com/more

Free mail doesn't cut it for business users

CONTINUED FROM PAGE 33

dles information technology services for the mountain resort.

"They are just too used to having a business-class E-mail system in place. They aren't just sending and receiving mail. They are doing calendaring and scheduling and accessing each other's E-mail," Hilton said. Some users maintain free mail services outside their corporate GroupWise account, he said. But groupware tasks seem to be important to users. And so far, those are best provided in the proprietary packages, he said.

Eric D. Weight, managing director at Blain, Olsen, White and Gurr in Salt Lake City, agreed. He said Web-based E-mail is fine for personal use. But the ad agency's 12 employees are very reliant on GroupWise for trading marketing and financial information and for setting up appointments. Free mail would be too insecure and not integrated with other functions, he said.

According to San Francisco-based Ferris Research, Inc., about 10% to 15% of large companies use Internet-based mail. For a while, large corporations were taking a shine to the Web-based option, but growth is slowing, Ferris researchers said. Security, scalability and reliability are obstacles.

ADDED VALUE

But Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif., said more Internet providers are beginning to offer E-mail service as a value-add for business customers.

For instance, San Jose, Calif.-based MediaGate, Inc. and Santa Barbara, Calif.-based Software.com are pitching a scalable messaging service that would let Internet service providers offer their users text, fax and voice over the Web.

Also, messaging services have been announced in the past few months by Atlanta-based BellSouth.net, which is positioning its Business E-mail service as secure, reliable and relatively spam-free.

And Columbus, Ohio-based CompuServe Network Services is pitching its WANmail service as an option for companies that want to outsource their mail tasks.

Still, free mail remains mostly a consumer-oriented phenomenon, Burns said. It would be tough for information systems staffers to give up that much control over a mission-critical application such as E-mail, she said.

MAIL ON THE RUN

But Laura Taylor, chief information officer at Schafer Corp., predicted the use of free E-mail servers by corporations will pick up in the years to come, "especially for business travelers who can get mail in kiosks in airports or hotels." Schafer is a defense, technology and professional consulting group in Arlington, Va.

Taylor, who has used free mail for several years, said businesses now have to foot the bill for laptops, administration, licensing fees and the encryption software necessary to tunnel safely through firewalls.

"A company that is providing 1,000 laptops at $5,000 a pop to its employees could instead be purchasing $1,300 desktops and save $3,700 per user, or a total of $3.7 million," she said. □

NEW PRODUCT

COMMENCE CORP. has announced Allure, a World Wide Web-based application server bundled with a database and 18 Internet business applications.

According to the Shrewsbury, N.J., company, the electronic commerce applications support catalogs, promotions, order tracking, customer self-service and employment opportunities. Users can customize or create new applications for vertical industries using an integrated development tool set.

Allure costs $9,995. That price includes the application server, 18 Web applications, an internal workgroup server with 10 clients and the database.

Commence
(732) 530-4566
www.commence.com

Microsoft: Hack no threat

CONTINUED FROM PAGE 33

rity people came out of CDC's Back Orifice presentation with their jaws on the floor," Fabro said. "Businesses should take this utility very seriously and adopt the proper precautions."

WINDOWS SECURITY

Once installed, the utility purportedly can read everything that the user types at the keyboard, according to documents posted on CDC's Web page.

This includes ". . . all cached passwords for Web sites, dial-up connections, network drives and printers and the passwords of any application that stores user passwords in the operating system," the document said.

DIRTY DEEDS

The document, authored by a hacker who goes by the name of Deth Veggie, also said Back Orifice can "make itself mostly invisible" and "create shares hidden to the user and list the passwords of existing shares." A share is a resource, such as a folder.

Not so, according to the responding document Microsoft posted on its Web page two weeks ago, which states that Back Orifice "does not expose or exploit any security issue with the Windows platform."

On its Web page, Microsoft states that "Back Orifice" does not compromise the security of a Windows network. "Instead, it relies on the user to install it and, once installed, has only the rights and privileges that the user has on the computer," the Microsoft document said.

Karan Khanna, product manager of Windows NT security at Microsoft, said the CDC is causing more confusion than problems.

"It's not a security issue," Khanna said. "It's no different than existing software, like PCAnywhere or Carbon Copy. Somebody else, if they could access my machine, could get information off it while I'm using PCAnywhere. . . . It's not because of any security issues with Windows."

Again, the hacker group disputes Microsoft's assertions, stating in its documentation that "Back Orifice does not rely on the user to install it. To install it, it simply needs to be run. Thanks to some actual exploits, there are several ways a program could be run on a Windows computer, not only without the user's approval but without the user's knowledge."

However, third-party security experts believe that in the right hands, the Back Orifice hack does represent a potential threat to the unwary business.

BEST DEFENSE

Microsoft advised users to secure their systems using safe practices such as a firewall or proxy server or to use an Internet service provider that dynamically assigns TCP/IP addresses.

About the only thing Microsoft and CDC agree on is that the Back Orifice hack doesn't affect Windows NT or Microsoft's BackOffice suite of server-based applications. □

Senior editor Sharon Gaudin contributed to this report.

Antivirus software already provides defense

The Back Orifice hack may be only a month old, but antivirus software makers have already released packages to defend against it.

Data Fellows Corp. in Espoo, Finland, and Panda Software, Inc. in San Francisco last week beefed up their respective products, F-Secure Anti-Virus and Panda Antivirus, with the capability to detect and remove the Back Orifice hack.

Back Orifice is a remote control tool that enables malicious intruders to tamper with Windows 95 and 98 desktops via remote Internet connections. Once in, hackers can view and modify Windows files, create files of the rightful PC owner's actions and even capture screen shots and transmit them to the hacker. In a worst-case scenario, Back Orifice can crash the PC.

The silver lining is that Back Orifice isn't a virus, said Mikko Hypponen, Data Fellows' manager of antivirus research. "Back Orifice is a trojan horse, and that means it still must be executed before it does anything. The hack can't infiltrate the PC automatically."

Users can download a free evaluation copy of F-Secure Anti-Virus from Data Fellows' Web page at *www.DataFellows.com/*.

— Laura DiDio

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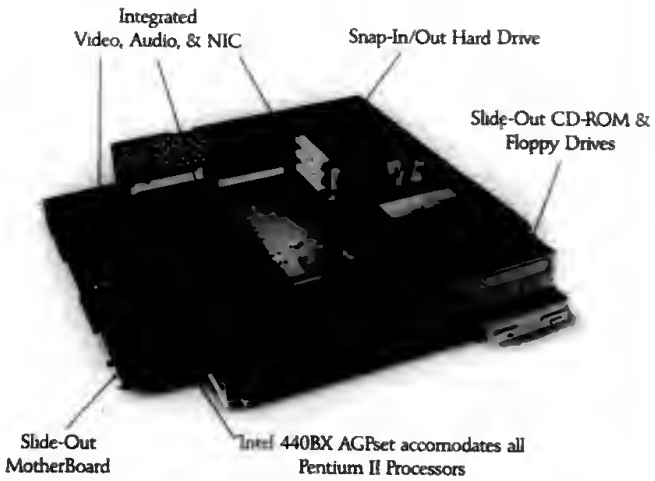

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Briefs

Gigabit Ethernet revenue forecast, 1998-2001

Base: Vendor interviews and sales data projections
Source: The Dell'Oro Group, Portola Valley, Calif.

Novell NDS tool

Novell, Inc. has released a technical support utility for Novell Directory Services (NDS). LogicSource for NDS enables users to identify, resolve and avoid error codes. Prices range from $295 to $5,995. The World Wide Web address is *http://support.novell.com/logicsource/nds.*

Antivirus package

Symantec Corp. in Cupertino, Calif., last week released Norton AntiVirus Version 5.0, which safeguards Windows 95, 98 and NT workstations from the latest viruses. Enhancements in Version 5.0 include the ability to isolate files with suspected viruses. It costs $49.95; upgrades cost $29.95.

Correlation engine

System Management Arts, Inc. in White Plains, N.Y., last week announced plans to integrate its InCharge analysis software with the enterprise management framework from Tivoli Systems, Inc. in Austin, Texas. The goal is to tap Tivoli's database to build InCharge's relationship models, which are mathematical grids that represent how pieces in a client/server-network affect one another.

Global monitoring

International Network Services, Inc. in Sunnyvale, Calif., is upgrading its network performance monitoring software this week to better support global organizations. Version 6.0 of EnterprisePro can report router use during office hours for European sites or all factories during production periods.

Discounts ease telco decisions

▸ MCI fund helps user justify network upgrade

By Matt Hamblen

CELLULAR CASSIERS often give away cell phones to attract customers willing to commit to a certain period of service. Why not do something similar on a larger scale?

Stephen Adams, director of information technology at recruiter Egon Zehnder International in Chicago, thought it was a good idea.

He hired MCI Communications Corp. in Washington a year ago to run his company's new network and got about 40% off on the switches, routers and other equipment he had to install to get service.

He also committed to at least $300,000 per year in network services for three years. But the savings on six Siemens Business Communications, Inc. private branch exchange switches is what sold him and his bosses on the deal.

Users have to make sure when they sign up that their networks can be expanded as their companies grow.
– Rosemary Cochran, Vertical Systems

The equipment cost "several hundreds of thousands" of dollars and was discounted under the NetworkMCI Fund program, which was designed to attract customers with financial incentives.

The fund "made MCI's contract easy to justify and unbeatable by any other vendor by a long shot," Adams said.

"It would have been extremely difficult to sell the network upgrade [to other top managers] without the fund," Adams said. He added that the savings will let his company expand beyond the nine cities in which it already operates.

It is fairly common for large telephone companies to enter into marketing agreements with equipment makers to sell equipment at low prices to end users in exchange for commitment to a long-term agreement, several analysts said.

Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass., said such deals can benefit end users, but users have to make sure when they sign up that their networks can be expanded as their companies grow..

Adams investigated a similar package of equipment and services from Sprint Corp. in Kansas City, Mo., and Lucent

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ANDY GOODMAN

NT 5.0's size means it's more than just an upgrade

HEAVYWEIGHT

Windows NT 5.0 will be the big dog on the block when it comes to lines of code. Here's how it will stack up:

Product	Lines of code
Unix	10 million to 15 million
NetWare 5.0	10 million
NT 4.0	16 million
NT 5.0	25 million to 40 million

Source: Competitive Systems Analysis, Inc., Danville, Calif.

By Sharon Gaudin

CORPORATE USERS already are worried about how much weight Microsoft Corp.'s Windows NT 5.0 is packing on. And some industry watchers wonder if that will keep some users from adopting it.

"It's an absolute monster. It's frightening that it's become that large," said Randall Kennedy, an analyst at Competitive Systems Analysis, Inc. in Danville, Calif. "What keeps IS administrators up at night is how to reconcile 30 million lines of code, make as many fundamental changes and still guarantee a reliable system. NT 5.0 is going to be bigger than IBM's MVS.

"It's making users hesitant to adopt something that large and complicated," he added. "When the code is actually hitting the machine, a lot is going on, more than at any other point in time, in any other operating system I'm aware of in the history of computing. It's pushing the PC platform very hard."

The upcoming version of NT is probably going to double in size in terms of lines of code. NT 4.0 rings in at around 16 million lines. NT 5.0, according to Microsoft, will be between 25

NT 5.0, page 42

Tests help prepare for Notes net

By Patrick Dryden

IS managers at ABN AMRO Bank are dissecting Lotus Notes transactions to prevent surprises when they migrate 11,000 users at small branch offices from Lotus Development Corp.'s CC:Mail to the bank's standard messaging software.

The goal is to predict response times across the bank's wide-area network, which links those sites at various speeds.

"In the past, we rolled out applications without advance testing and wound up with inadequate response times and sometimes slowed performance for users of time-critical tools," said John Pittas, a systems officer responsible for software quality assurance and troubleshooting at the Amsterdam-based bank's North American headquarters in Chicago.

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Contents:

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2 RS/6000 H50 servers

AIX operating system

High availability clustering software

High availability disk storage

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Win 98 users gain virtual nets

By Bob Wallace

TELECOMMUTERS AND mobile users running Microsoft Corp.'s Windows 98 on their computers can now access virtual private networks (VPN) built on equipment from Compatible Systems Corp.

Internet VPNs, where remote workers use the Internet instead of toll-free lines to carry data, are a less expensive alternative to modem banks and remote access servers for supporting farflung workers, experts say.

Boulder, Colo.-based Compatible recently announced it will offer free downloadable software that enables its VPN equipment to support remote users running Windows 98.

REMOTE ACCESS

"What Compatible is doing is positioning for the next information technology transition," said Matt Kovar, an analyst at The Yankee Group. "The majority of large corporations have not yet made the move to Windows 98 yet." But when those companies are ready, Compatible will be equipped to handle the demand, he added.

And so will others. Vendors such as Axent Technologies, Inc. in Rockville, Md., Shiva Corp. in Bedford, Mass.; and Internet Devices, Inc. in Sunnyvale, Calif., have announced Windows 98 client support for their VPN products, according to TeleChoice, Inc., a consulting firm in Verona, N.J.

Compatible's customers can download free software from the firm's World Wide Web site (*www.compatible.com*) to their IntraPort VPN Access Servers. Remote workers dial in to these servers to access computing resources.

The IntraPorts already support remote users running Windows 95, Windows NT, Mac OS and Linux and can be used at sites ranging from small offices to corporate headquarters.

IntraPort servers vary in size from a model that can support eight simultaneous users to one that can support more than 2,000 simultaneous users. The servers come with three levels of encryption including Data Encryption Standard. □

Telco discounts

CONTINUED FROM PAGE 39

Technologies in Warren, N.J., but the MCI/Siemens deal was much better. "MCI had a huge leg up because it has local service in all the places we want to be," Adams said.

He said the purchase of MCI by WorldCom, Inc. in Jackson, Miss., will help because WorldCom has even more cities with the local loop to add to the long-distance service.

Adams created a network that allows executive search consultants to share data on a search in real time from all over North America.

OUTSIDE SOURCE

The MCI deal was important because Adams knew his company would grow and spend easily more than $300,000 per year. Egon Zehnder has a flat organization, and bosses "want to keep the IT staff lean," Adams said. "It's our intentional goal to depend on outside resources. With telecom, having one person to yell at is the key."

The biggest difficulty in setting up the new network was working with local telephone companies , in making the changeover, Adams said. In rewiring the Chicago office, a local provider couldn't bring digital service when Egon Zehnder wanted it, so Adams had MCI reconfigure the new PBXs with analog cards until the change could be made.

"The local telcos are a pain in the neck," he said. "They fall behind schedule, and if there's a problem, they always say it's the fault of the other vendor." □

Tests help prepare for Notes network

CONTINUED FROM PAGE 39

Now the goal is to predict performance across the WAN "so the business and information systems groups can negotiate service levels without misunderstandings or great expectations," Pittas said.

In this case, response time for users on a LAN is "almost instantaneous" when they simply open the Notes mail database, Pittas said. He profiled all exchanges between one client and one server using Application Expert analysis software from Optimal Networks Corp. in Palo Alto, Calif., and then predicted how performance would change.

Initial projections showed that this basic transaction with a central server would take 17.3 seconds across a "moderately busy" WAN link running at 64K bit/sec., Pittas said.

Doubling bandwidth could nearly halve that response time, yet each improvement represents a costly WAN upgrade. At best, a T1 link running at 1.5M bit/sec. — the fastest connection available to these branch offices — would reduce this transaction to 2.5 seconds, according to predictions by Application Expert.

That wait may be too much for messaging users at some sites, and longer response times for users of a Notes-based application may be completely unacceptable when they deal with customers on the phone or in their office, Pittas said.

These predictions turned out to be slightly optimistic. Pittas' team pinged random sites to get a more realistic measurement of network latency, which would further slow real-world response times.

Such performance models let the bank's IS planners build a matrix showing response time vs. cost of network service. Then they can determine whether to boost bandwidth or install a local server at some sites to decentralize the data.

Past experience showed that putting a Notes server at sites with 250 or more users is cheaper than upgrading that site's WAN link, said an assistant vice president at the bank who requested anonymity.

"But the first 300 branch offices we'll migrate have from six to 150 users. So this analysis helps us compare bandwidth upgrade to server placement so we can guarantee the response that each office needs," he said.

Next, Pittas said he will scrutinize actual transactions between remote sites and central servers so that Optimal Networks' simulation software can predict the impact of a new application load. Then it is possible to tune performance by juggling variables such as number of users, link speeds and device placement.

Accurate predictions for this CC:Mail-to-Notes migration are vital because "the bank absolutely depends on communication," the assistant vice president said. "We couldn't guarantee response times when the network, systems and application groups worked alone. Now someone with a single view can take responsibility for performance." □

NEW PRODUCTS

CISCO SYSTEMS, INC. has announced Cisco IOS for S/390 Version 2, a mainframe-based implementation of TCP/IP.

The San Jose, Calif., company said the software offers throughput up to 13.5M byte/sec. for file transfer protocol, which can be used for file exchanges between a mainframe and Unix systems or PCs. Version 2 also enables MVS users to send print data to TCP/IP network printers. Network users can send files to local mainframe printers.

Pricing begins at $32,000.

Cisco Systems
(408) 526-4000
www.cisco.com

SYMPLEX COMMUNICATIONS has announced Datamizer Pro, a routing and data compression device for small or remote offices.

According to the Ann Arbor, Mich., company, it was designed to increase throughput by up to four times over services such as frame relay, T1 and Integrated Services Digital Network. It provides end-to-end compression over the Internet and has one BRI port, one serial port and two plain-old telephone service ports. Pricing starts at $1,495, with the serial port as an option.

Symplex Communications
(734) 995-1555
www.symplex.com

NT 5.0 is more than an upgrade

CONTINUED FROM PAGE 39

million and 30 million lines, though industry watchers say that number could be closer to 40 million or even 50 million.

And if Version 5.0 is more like a new product than a new version, users may wonder what administrative and training problems await them.

"The big concern with NT is that it's been so long since 4.0," said Larry Podmolik, vice president of research and development at Strategic Technology Resources in Chicago. "It won't be an evolutionary path. I expect it to be major — like a whole brand-new product. The more stuff they dump in there, the more issues we're going to have to deal with."

Bob Frase, chief financial officer at the United Paperworkers International Union in Nashville, said programmers are forgetting about the art of writing code; cheap storage has made them sloppy. "Programmers used to write such nice, neat concise code back in the old days," Frase said. "Then memory became relatively inexpensive, and that got thrown out the window. Now nobody worries about the size of what they're giving you. It puts us between a rock and a hard place."

BUG WATCH

And that size has some users wondering what bugs will be lurking behind all that code.

Kennedy said he is recommending that users wait a year after NT 5.0 comes out to adopt it because there is a lot of room in all those lines of code for bugs to hide. Microsoft hasn't announced any official release date for NT 5.0, though users and analysts expect it anywhere from mid-1999 to 2000.

Microsoft executives say NT 5.0 is growing because so many features are being added to it. An active directory and beefed-up security are features they say users have wanted. And new features means more code.

Jeff Price, lead product manager for NT Server, said Microsoft is doing extra testing on NT 5.0 to dig out any bugs. In fact, the second beta version now won't be out until the end of the summer — instead of June as originally planned — to allow for more testing. □

Software

Databases • Development • Operating Systems

Briefs

Revenue losses caused by software piracy, 1997

1. U.S.	$2.7 billion
2. China	$1.4 billion
3. Japan	$732 million
4. Korea	$682 million
5. Germany	$609 million

Source: Business Software Alliance and Software Publishers Association, both in Washington

Y2K lease deal

Galileo International, a Chicago-based travel industry reservations provider, has purchased BMC Corp.'s TransFinder software for year 2000 application testing. Galileo will use the software to make a point-in-time copy of its multiterabyte-size reservation database without disrupting developer testing.

Pilot suite

Pilot Software, Inc. has announced Pilot Decision Support Suite Version 6, software that analyzes operational, market and customer data to uncover trends.

The Cambridge, Mass., company said the suite incorporates predictive data mining, online analytical processing, support for ActiveX and point-and-click customization tools. Version 6 enhancements include a Briefing Book Viewer that lets users save analyses, an improved quadrant analyzer that can give three-dimensional perspectives and simplified maintenance. Pricing starts at $90,000.

TAKE A SEAT

Estimated number of end-user seats sold by application vendors, 1994 to 1997

	User seats
SAP	2.2 million
Baan	380,000
PeopleSoft	300,000
Oracle	250,000
J. D. Edwards	240,000
Others	500,000
Total	3.9 million

Based on publicly disclosed revenue and per-seat pricing figures

Source: The Yankee Group, Boston

Oracle offers up speedy 2000 fix

▸ *Suite can be up and running in 60 days*

By David Orenstein

ORACLE CORP. recently announced that for $300,000 it will set up midsize companies with year 2000-compliant financial applications in 60 days. Users and analysts said the rapid implementation can be done — though they noted the price tag doesn't include the conversion of legacy data.

FINANCIAL APPLICATIONS

The Redwood Shores, Calif., database company, which is trying to shore up its application sales, will throw in 30 days of consulting and five days of training to its offering of FastForward Financials Y2K. The suite includes a 25-user license of Oracle General Ledger, Payables, Assets, Purchasing and Receivables applications and will be available Sept. 15.

The service is aimed at companies that are running out of time for more comprehensive fixes.

Accomplishing much if not

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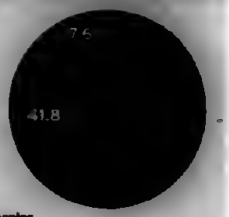
YEAR 2000 STRATEGY UPDATE

- Renovate existing code and data
- Replace older systems with commercially available software
- Rewrite or rehost applications or re-engineer business processes



Base: January 1998 survey of 165 companies with annual revenue of $100 million or more

Source: International Data Corp., Framingham, Mass.

Agency pulls Sybase plug

▸ *Swiss find database that's 30 times faster*

By Mary Lisbeth D'Amico

THE HEADQUARTERS of the Bern Department of Justice — set in an old castle in Bern, Switzerland — looks quaint and idyllic. But inside the 12th-century walls, the people in charge of the state agency's computer systems have to keep their software up to date — or face bottlenecks.

The agency recently spent six months adapting its courthouse administration application, called Tribuna 2000, to run on a new database that runs much faster, even though the agency isn't using all the new features.

The previous database — Sybase, Inc.'s SQL Server System 10 — which the Bern DOJ installed only two years before, had performance and scalability problems, said Rolf Streb, the agency's information technology director. It also wasn't very stable running on Windows NT 4.0, which the agency upgraded to from NT Version 3.51 last year, he said.

Upgrading to SQL Server System 11 helped the stability, but the agency wanted to improve performance to keep up with as many as a half-million transac-

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Creator is sanguine about Linux future

As a college student in his native Finland in 1991, Linus Torvalds, now 28, wrote the first kernel of the Linux operating system — the freely distributed version of Unix — as a hobby. Today, he's still at the center of the volunteers who are developing Linux.

Since its creation, the operating system has evolved into a major platform, with an estimated 5 million to 10 million users. This summer, major software vendors such as Oracle Corp. and Informix Corp. have announced database products for Linux, and Corel Corp. has announced an office productivity suite for the platform. Netscape Communications Corp. also has released its Navigator World Wide Web browser for Linux. Computerworld West Coast Bureau Chief Galen Gruman and staff writer David Orenstein recently interviewed Torvalds — now a Silicon Valley resident and employee of Transmeta Corp., a chip-design company in Santa Clara, Calif. — to get a view of the operating system through the eyes of its creator.

On Linux's beginning:

"It wasn't meant to be a big, professional operating system. It was more meant to be [for] my own personal enjoyment. I was 21, and I had no idea what I was doing. How hard can it be? It's just an operating system. Being completely ignorant about the size of the project, I didn't have any inhibitions

Linux, page 44

Snapshot

Application report card

Head-to-head ratings of financial application vendors on a scale of 1 to 10 (1=worst, 10=best)

	Financial performance	Company direction	Product range	Product flexibility
SAP	10	8	9	7
PeopleSoft	9	8	7	9
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Source: Research and evaluation opinions by Ovum Ltd., London

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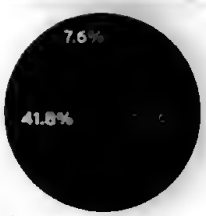

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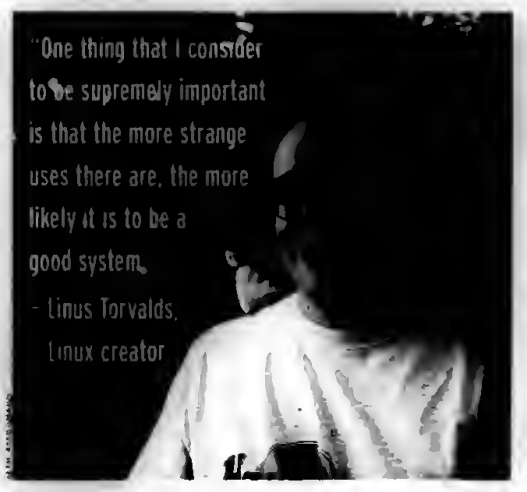

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Source: Research and evaluation opinions by Ovum Ltd., London

Adobe to slash jobs

By Torsten Busse
SAN FRANCISCO

LOWERING ITS earnings expectation, Adobe Systems, Inc. last week announced a cost-cutting program that calls for the elimination of up to 300 positions worldwide and the reorganization of its operational divisions and senior management.

The cost-reduction program, intended to achieve long-term growth, is expected to result in annual savings of $50 million to $60 million, the graphics and printer software maker said.

Citing weak sales in Japan and the delay of a major product upgrade, Adobe's co-chairman and president Charles Geschke said revenue for the company's third quarter of fiscal 1998 — ending Aug. 28 — may be below analysts' expectations.

Geschke said a product, which he declined to name, that was previously expected to be updated in the third quarter of this year will now be delivered in the fourth quarter. Meanwhile, the company experienced a 40% drop in revenue year-to-year in Japan, Geschke said.

The Adobe layoffs will come mostly from the management ranks and will be concentrated in North America, he said.

THE NUMBERS

Based on preliminary analysis of third-quarter results, Adobe said revenue is likely to be in the range of $220 million to $225 million, compared with $230 million reported in the third quarter of fiscal 1997, according to Geschke.

After a one-time restructuring charge and other nonrecurring expenses, Adobe's net income may approach break-even or be a loss, compared with net income of $53.4 million for the year-ago quarter. The third quarter of fiscal 1997 included gains of $12.9 million from the sale of securities.

"These expected results are unacceptable," John Warnock, co-chairman and CEO of Adobe, said in a statement.

The reorganization of Adobe's operating divisions and management structure, also announced last week, will align marketing functions and product development. The company will now focus on delivering integrated products to professional publishers and graphics-oriented consumers and businesspeople.

In addition, Adobe will focus its marketing more on consumers and address the needs of sectors such as medical, government, law and insurance, all traditionally heavy paper users now looking to move to electronic workflow and publishing methods.

Adobe also scrapped the positions of executive vice president and chief administrative officer, executive vice president for marketing; and executive vice president for product divisions. The positions had been held by Jackson Bell, Robert Roblin and Ross Bott, respectively, each of whom resigned. Warnock and Geschke will continue to co-chair Adobe. □

Busse writes for the IDG News Service in San Francisco.

Agency pulls Sybase plug

CONTINUED FROM PAGE 43

tions per day, Streb said.

So it moved to InterSystems, Inc.'s Cache, which is up to 100 times faster at processing transactions than the old Sybase system and 20 to 30 times faster than the new one, Streb said.

With the Sybase system, some Bern DOJ offices weren't able to process data queries in the same working day, leading to significant delays, he said.

One reason Cache is so fast, Streb said, is its ability to automatically prestore frequently executed procedures. It automatically stores queries made in SQL so the next time it performs the procedure, it doesn't have to recreate the SQL script that executes the query.

With other databases, Streb said, in-house developers have to write the stored procedures themselves.

"We refuse to do that," he said. "It's a question of money, support and maintainability."

And it will continue to use SQL to avoid changing Tribuna 2000 to handle object-oriented languages such as Java or C++, even though that would improve its speed.

Object databases are better suited for users who have highly complex transactions to conduct, according to John Radcliffe, a database analyst at Gartner Group, Inc.

The investment will cost about the same initially as the prior database, in which the Bern DOJ invested 1 million Swiss francs ($671,000), not counting maintenance costs, according to Streb. The agency may consider switching to NT 5.0, eventually. "We have a well-functioning system, so we'll leave it for the time being," Streb said. □

D'Amico writes for the IDG News Service in Munich.

Oracle's speedy 2000 fix

CONTINUED FROM PAGE 43

all of the work within the 60-day time frame is possible. Joseph Krayeski, assistant controller at 1-800-Flowers, Inc. in Westbury, N.Y., said the company ported legacy data and installed the general ledger and payables applications in 45 days last fall. Nancy Wolff, chief information officer at Impac Hotels Group LLC in Atlanta, oversaw the conversion of legacy data and the installation of the receivables, payables and general ledger within the 60-day time frame in the spring.

"It can be very daunting," Krayeski said. "[But] if you stay focused, it will be done."

Wolff said the installation process proceeded rapidly even though the company became distracted by a merger. Some analysts said Oracle's offering could help companies that should already have addressed year 2000 issues slip in under the wire with a quick fix.

But Tom Oleson, an analyst at International Data Corp. in Framingham, Mass., said his firm is generally advising companies to renovate existing systems and data rather than use packaged applications that could take considerable time to tailor to a company's specific business processes. □

Creator is sanguine about Linux future

CONTINUED FROM PAGE 43

about doing something stupid. I could say that if I had known, I wouldn't have started, but at the same time, if I had known how fun and how successful it was to become, I would have started."

On strange Linux uses:

"One thing that I consider to be supremely important is that the more strange uses there are, the more likely it is to be a good system. It improved dramatically when I made it available to others. . . . If there is one goal I have, it's more of an overall diversity goal. Somebody ported Linux to the PalmPilot. He was crazy or the group was crazy . . . but I was overjoyed to see the project."

On stranger Linux uses:

"There was this report about some Japanese company [that] had this prototype [of] a refrigerator that had an LCD display. It happened to run Linux. . . . It had Netscape, also. Actually, the really ridiculous [instance] is that some Linux person was actually trying to crack [Actimates Interactive] Barney [Microsoft's talking version of the dinosaur doll] to get Linux onto the thing instead."

On the commercial rush to Linux:

"Partly, it's obviously public relations [for the vendor firms]. It's been in the news a lot. Netscape changed the public knowledge about Linux quite a lot. Oracle and Informix would have ported at some point anyway, just because a lot of their clients probably are mentioning Linux."

On the market:

"Linux is the No. 1 Unix in Germany, and in the whole world it's No. 2, after Solaris."

On being apart from the other Unixes:

"Linux has certainly been helped by Unix vendors just being completely not in touch with what people want. The [vendors] essentially gave up on [Unix 00] the desktop. They didn't try to even make it easy to install on a desktop. They didn't try to make it pleasant after it was installed."

On the benefits of commercial Linux:

"Sometimes I get the question, 'Aren't you upset by companies like Red Hat, Inc. making money off something you wrote?' And the answer is 'no,' because I'm so happy with what they've done for Linux.

"I think that the commercial Linux companies — Red Hat is just one of them; S.U.S.E., Inc., Slackware, VA Research, Inc. [are others] — they've done a lot of good things, and we've gotten more of a balance between purely technical and the purely marketplace [developer perspectives]."

On competing operating systems:

"I actually think that within a few years, Apple will cease to exist simply because it's too hard to compete against Microsoft. Linux doesn't have the same commercial pressures.

"People are nervous about taking their software . . . and putting it on a Microsoft platform, just because the platform is so strongly controlled by one company. Linux is, in that sense, maybe even a safer platform for commercial companies."

On Linux as his hobby:

"I have a job here in the area. I explicitly didn't want to work in a Linux-related capacity because I didn't want to get that commercial kind of feeling."

A demanding hobby:

"On average, I almost have to read E-mail [from developers] for two hours a day just to keep up. On top of those two hours, [there are] two or three hours to actually do something about it."

On the pro-Linux advocacy:

"A lot of it is too much. I try to not get involved." □

MORE ONLINE

For an expanded interview with Torvalds and for links to Linux resources, events, news and more, visit *Computerworld online.*

www.computerworld.com/more

Columnist Dan Gillmor comments on Linux. Page 30

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Servers & PCs

Large Systems • Workstations • Portable Computing

Briefs

Worldwide desktop PC shipments, 1996-2002

* Projected

Base: Vendor shipments and sales data projections

Source: International Data Corp., Framingham, Mass.

Compaq cuts prices

Compaq Computer Corp. last week said it would cut prices on some models in its ProLiant and ProSignia server lines by up to 14%. The ProSignia 200-SE now sells for $4,145, down from $4,375; the ProLiant 800 is now priced at $2,869, down from $3,317; and the ProLiant 1600, which now sells for $5,256, fell from $6,374.

Intel's Xeon delayed

Intel Corp. confirmed another delay would stall deliveries of its Pentium II Xeon processor. The 450-MHz processor will ship in the fourth quarter as planned but only for use in workstations and servers that use one or two processors. Customers looking for four-way servers with the 450-MHz chip will have to wait until next year, an Intel spokeswoman said.

Build-to-order Macs

Apple Computer, Inc. in Cupertino, Calif., said customers can buy build-to-order Macintoshes from resellers. Previously, that capability was available only through the World Wide Web. The new offer is for Power Macintosh G3 computers. An Apple spokeswoman said having resellers sell the systems will help first-time buyers get a machine that's closer to what they want, and will help experienced users who want personalized advice and service.

Dell makes NT server splash

▶ *Service, cost-effectiveness attract users*

By April Jacobs

GIVING CUSTOMERS what they want — security and reliability — has launched Dell Computer Corp. close to the top of the Intel server market just a few years after it made its entry, analysts said.

Dell, in Round Rock, Texas, is still leaps and bounds behind No. 1 Compaq Computer Corp. in Houston. But it has experienced phenomenal growth during the past year, doubling sales in the U.S., according to International Data Corp. in Framingham, Mass.

PRICE COMPETITION

Analysts said a good part of that success comes from the company's powerful, cost-effective PowerEdge servers, which are aimed at a market that is looking for a brand-name Intel Corp.-based server that won't break the bank.

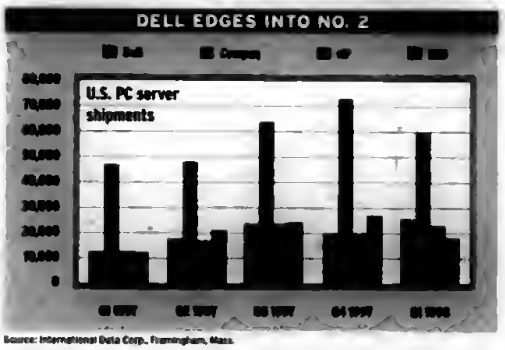
"From a price/performance standpoint, Dell ships very well-designed server products aimed at the core of the market," said John Dunkle, president of Workgroup Strategic Services, Inc. in Portsmouth, N.H.

Dunkle said that beyond price competitiveness, however, Dell also came to market with machines preloaded and optimized for NT — meaning that drivers and software would be ready to run as soon as they come through a customer's door. That makes life easier for information technology managers and saves time and money.

Dell has also successfully played up its direct-sell and customization process in the corporate desktop arena. It has made such a splash there that competitors such as IBM and Compaq have followed the company's lead during the past year in an attempt to play catch-up.

Steve Kleynhans, an analyst at Stamford, Conn.-based Meta Group, Inc., said the part of the market on which Dell focuses

Dell, page 48



Source: International Data Corp., Framingham, Mass.

New models boost HP 3000 turnaround

By Jaikumar Vijayan

HEWLETT-PACKARD CO. is building on its strategy to revitalize the once-fading HP 3000 midrange server platform with three new models and revamped pricing.

The moves, unveiled at the HP World show in San Diego this month, come on the heels of HP's announcement last month that it will support Intel Corp.'s forthcoming Merced chip on the HP 3000.

After sales declines in 1996 and early 1997, the HP 3000 has experienced double-digit revenue growth, according to HP [CW, July 20].

The new servers — which include a six-way system based on the high-performance PA-8200 RISC chip — will give Knight-Ridder, Inc. a way to upgrade some of its older HP 3000s, said Rich Postmus, manager of wide-area networks at the Miami-based media company.

The move to the new servers will depend "on our performance requirements. . . . But it is nice to see an upgrade path," Postmus said.

Similarly, Stone Container Corp. in Chicago, which purchased 60 new HP 3000s last year, has no immediate plans to acquire any more. But "I trust the new models are consistent with the strategy HP has shared with Stone," said Mary Ellen Woods, manager of applications development at the packaging company.

With the latest additions (see chart, below), the HP 3000 lineup features a new entry point: the HP 3000 929KS/020. HP is positioning that server as a consolidation platform for some of its older HP 3000 boxes. In fact, the company is offering up to a 45% rebate on database and MPE/IX user licenses when an older box is swapped for that model.

Prices also have been rolled back to make way for the newer models. □

Expanding the HP 3000 server lineup

- **HP 3000 997 series:** Supports up to eight-way PA-RISC processing
- **HP 3000 989KS:** Available in one-, two-, four- and six-way PA-8200-based configurations
- **HP 3000 929KS/020:** Entry-level configuration

PRODUCT REVIEW

▶ *Sony VAIO 505G and 505GX notebooks*

OVERALL B GRADE

SONY ELECTRONICS, INC.
(888) 315-7669
www.sony.com/pc

Price: $1,999 (505G), $2,699 (505GX)

Pros: Compact and light; good power management; pretty good multimedia support

Cons: Size and weight limit configuration options; CD-ROM an external option; use of common ports requires a port replicator

Sony laptops right size, but lack options

By Lenny Bailes

CURRENT WISDOM among notebook computer manufacturers is that smaller is better. That's true despite users' preference for capable systems that usually require more size and weight than the lightest machines.

But notebook makers continue to look for the best of both worlds. Sony Electronics, Inc. has become the latest notebook maker to try to appeal to corporate users with a thin but capable notebook.

Sony's VAIO 505G and 505GX notebooks are among the first to arrive in the marketplace with the SuperSlim size. These notebooks are less than 1-in. thick and slightly smaller in area than a standard sheet of

Sony, page 48

Smuggling to blame for chip hike

By Sumner Lemon
HONG KONG

A DRAMATIC increase in the price of CPUs in China has resulted from a chip shortage that many attribute to a recently launched antismuggling campaign.

The crackdown aims to stem the influx of goods through illegal channels that skirt import duties and tariffs. The practice is so widespread that cutting off the flow has caused a significant shortage of CPUs, as well as a corresponding price increase.

In Beijing's Zhongguancun district, for example, the street price for a 266-MHz Intel Pentium II microprocessor recently reached $266, up 22% from early last month, according to sources close to resellers in the area.

In contrast, Intel Corp.'s most recent price list quotes that processor at $159 in quantities of 1,000.

Intel officials denied the antismuggling campaign was to blame for any product shortfall.

"Is it because of the antismuggling campaign that we have a shortage of product [in China]? It doesn't relate — no," said Annie Lau, an Intel spokeswoman in Hong Kong.

GETTING PRODUCT IN

However, Lau appears to stand alone in her assessment of the current market situation.

"The product in the general market is at quite a shortage right now," said Jacqueline Leung, country manager for China and Hong Kong at Advanced Micro Devices, Inc. "I think there are several reasons for it. I think maybe the main reason is because of the tightening of the Customs [service]. That's one of the key issues. With limited product, of course, the price will be going up."

"The problem is that people can't compete in the market unless [the product is] smuggled in," said Dane Anderson, director of computing systems research at International Data Corp. (IDC) Asia-Pacific.

"I think everyone . . . is trying to figure out how to compete in the new environment. I don't know that it's definitely a shortage of product as much as it is plenty of product — but not knowing how to get it into the country and compete at the prices that the market competes at," he added.

Evidence that distributors have managed to avoid paying tariffs on IT products, including CPUs, isn't hard to come by, Anderson said.

The CPU market is expected eventually to pick up as suppliers will be forced to make shipments in order to stay in business.

"People always keep on talking and keep on listening so someone will be afraid of [the antismuggling campaign] for sure," Leung said.

Mainland China customers may be struggling to determine how they can continue to compete in the People's Republic of China market.

SMALL SHOPS HURT

For now, the ones most likely to be hit hardest by the current price increases aren't the large Chinese manufacturers, which receive large quantities of CPUs from vendors at a significant discount, but the small, independent shops, according to Bill Wang, director and consultant at Beijing-based market research firm China Research Corp.

Most of those small PC stores operate on margins of $6 to $60 per PC sold, he said, and any increase in component price eats into profits. □

Lemon writes for Computerworld Hong Kong.

Dell makes NT server splash

CONTINUED FROM PAGE 47

makes its ability to compete on price essential, something it has done successfully.

"The file-and-print and low-end NT application market is very well-understood, and there isn't a lot of finesse required there," Kleynhans said. He added that Dell also sells quite a few NetWare-based systems, which are also mature and relatively simple in nature.

"Dell is in a market where the differentiation between products is very small, making the big difference price," he said. Kleynhans said Dell has also been able to build on its one-on-one customer approach to give even small and midsize business customers the attention that is normally reserved for large corporate customers.

"Some of that is hype, but some of it is not," he said.

For example, Dell offers all corporate customers their own Web page to allow them to track Dell hardware. End users can track delivery of new systems, but more important, after the sale they have an easy way to access detailed information for service and support.

To maintain its momentum, Dunkle said, Dell will have to continue to extend the capabilities of its NT servers.

Dunkle said like all vendors, Dell can't rest on its laurels but will have to continue to strive to meet increasing expectations of users in both the technology and service arenas. □

NEW PRODUCTS

MERIDIAN DATA, INC. has announced a 16G-byte Snap Server, a network-attachable data storage device.

According to the Scotts Valley, Calif., company, the increased-capacity storage server plugs directly in to an Ethernet port while the network is running. Network users then access the disk in the same way they would access a disk assigned to a full-fledged network server. The Snap Server costs $2,195.

Meridian Data
(408) 438-3100
www.meridian-data.com

HEWLETT-PACKARD CO. has announced the OmniBook 2100, a notebook computer with an Intel Corp. 233-MHz or 266-MHz Pentium II processor.

According to the Palo Alto, Calif., firm, the notebook comes with either a 3.2G-byte or a 4G-byte hard drive, as well as hot-swappable modules, including a 24-speed CD-ROM and floppy disk drives. Pricing ranges from $2,099 to $3,099.

Hewlett-Packard
(650) 857-1501
www.hp.com

▶REVIEW

Sony VAIO laptops

CONTINUED FROM PAGE 47

typing paper. I looked at the prerelease version of the 505G.

In its standard configuration, the VAIO weighs only 3 pounds. But many users will quickly add in that — the weight will grow by 1.5 pounds with the detachable port replicator and external floppy drive (which are included with the basic package) and by another half-pound for a $300 external CD-ROM drive.

Sony is known for the consumer bent of its PCs, and the VAIO notebooks are no exception. The basic features skew toward home consumers more than business users.

But even in its standard configuration with replicator attached, the VAIOs offer most of the features found in more expensive, larger notebooks.

Sony is known for the consumer bent of its PCs, and the VAIO notebooks are no exception. The basic features skew toward home consumers more than business users. The slim design more than anything is what will appeal to business users.

The VAIO notebooks include a 10.4-in. thin film transistor display and an MPEG-accelerated video circuitry that delivers undistorted, full-screen playback of multimedia video. There are several home-oriented programs included as well, such as Sony's Picturegear Digital Photo Manager, Microsoft Corp.'s Money and Intuit, Inc.'s Quicken Basic, and Microsoft Works for light business use.

Both machines include a 56K bit/sec. internal modem, just one PC Card slot and a Universal Serial Bus port.

The chief virtue of these machines is their portability, but that's also their principal limitation.

The 14-speed external CD-ROM drive, which must be purchased separately, uses the system's only PC Card slot. And it must be plugged in to a separate AC adapter, so you won't be using it on airplane flights. In order to print, or gain access to floppy disks, external serial, keyboard and mouse ports, you must plug in the port replicator attachment or external floppy drive.

The 505G ships with a 200-MHz MMX Pentium processor. The 505GX's processor runs at 266 MHz, and this model has an I-link (IEEE 1394 Firewire) port to accommodate Sony's Digital Handycam Camcorder. Otherwise, the two models are identical.

The 505G unit that I worked with performed very well for a machine of its CPU class. Its screen display was crisp and its disk access speedy.

Sony also got the Windows 98 power management features right. The hibernate-to-disk and suspend-to-RAM features worked perfectly in my tests, snapping the machine out of low-power state with a single key press. Mobile users will need those capabilities, because the standard battery has an estimated life of only 1.5 to 2.5 hours. An optional long-life battery can extend this time to 5 to 6.5 hours.

The 83-character keyboard is small but functional, with duplicate Shift, Ctrl, Alt and Function keys and large Enter and Backspace keys. The 505G and GX both include a programmable power key on the side of the case that gives you one-button access to the function of your choice. The key works with modifiers such as Alt, Ctrl and Shift, letting you create several shortcuts.

Currently, Sony's SuperSlim form factor supports only 2.1G-byte hard disk configurations. That may limit these machines' effectiveness as professional design tools but should be no impediment to their use in creating business presentations and displaying MPEG-1 multimedia. These units should be a good buy for mobile users of Office 97 who need to shed weight and space in their travel bags. Sony offers a 64M-byte RAM configuration for both machines, with an upgrade to 96M bytes expected to be available this quarter. □

Bailes is a writer, teacher and consultant in the San Francisco Bay area. He is author of The Byte Guide to Optimizing Windows 95.

Managing

Tony De[illegible]sco says a [illegible] helps [illegible] precious yea[illegible]ng time

MANAGING YEAR 2000

TESTING: Every se counts

Face it — you don't have as much time as you hoped for year 2000 testing. Here's how to make the most of the time that's left

By Kathleen Melymuka

If you think year 2000 inventory and remediation is tough, wait till you see the 800-pound gorilla waiting around the corner.

"We'll spend about 65% of our project time on testing," says Tony Del Duca, year 2000 project manager at Nabisco, Inc., the Parsippany, N.J.-based maker of snacks such as Oreo cookies and Ritz crackers. "But if that's news to people right now, they'd better be looking for another job."

All of the dozen project managers queried say they plan to spend 50% to 65% of year 2000 project time on testing. And most agree that no matter how much time you spend on testing, it isn't enough. But there are ways to make the most of the testing time you have. Proper planning, stringent control, practical use of resources and tools, creative approaches and keeping the enterprise focused on year 2000 can make all the difference.

Testing, page 50

Time-saving testing tips

- When choosing your date-fixing method, consider how long it will take to test repaired code.
- Don't let your remediation team work on code that's not year 2000-related. If it does, you'll have to test that code as well.
- Focus testing on mission-critical systems and functions; have contingency plans in place for critical and noncritical systems.
- Use familiar testing tools as much as you can, but don't ignore time-saving year 2000 tools.
- Use limited partitions on mainframes and dedicated year 2000 test servers in distributed systems to avoid fighting for resources and to prevent hardware crashes.
- Use disaster recovery services for sophisticated testing.
- Consider extra work shifts to squeeze more time out of the day.
- Maintain year 2000 as a top company priority so you can have first claim on resources.

TESTING: Every second counts

CONTINUED FROM PAGE 49

The year 2000 testing task is so daunting that it's tempting to get moving immediately. But good, up-front planning can save weeks on the back end.

If your company is a latecomer to year 2000 and you haven't begun to fix date code, how you plan your conversion can make a big difference in testing time. One large insurance company reduced the amount of code it needed to test from 80% to just 10%. It did that by using the "added-logic" conversion method, according to the project manager, who spoke on condition that he not be named.

MANAGING YEAR 2000

Rather than expand dates to four digits, the project team added logic to the source code to interpret two-digit dates. Any date less than 50 is interpreted as 20xx, so 12 would mean 2012. Any date greater than 50 is interpreted as 19xx, so 72 would mean 1972. The change works well except with birth dates, the project manager says, and the team developed special logic to handle those. By using the added-logic method, you don't need to change any data files, so you don't need to test the programs that use the data files as you normally would, the project manager says.

If you do change date code in your remediation, don't get carried away and fix other things or you'll have to do more testing.

But chances are you won't have time to test everything, so you'll need to prioritize testing just as you did for remediation. "You have to decide what you have to test and what you're willing to gamble on. But that decision should have been made before. You should be working only on mission-critical systems now," says Jack Sanders, year 2000 project manager at Fina Oil and Chemical Co. in Dallas.

If you still need to triage for testing, your disaster recovery plan is a good place to start, says David Register, information technology project manager for year 2000 at Pacific Corp., a Portland, Ore.-based power company. "The business units have already said these are the applications we absolutely have to have," he says.

NO COMPROMISE

Having good contingency plans in place for non-mission-critical systems can make you feel less uneasy about not having the time to test them as you'd like, says Steve Jost, project manager of the year 2000 conversion service at Deere & Co. in Moline, Ill. "We are not going to compromise [our remediation process] because time is running out," he says. "For applications that may not get converted in time, we emphasize contingency plans as an alternative."

If you haven't let the remediation team fiddle with nondate code, don't waste time testing nondate logic, says Irene Dec, vice president of information systems at Prudential Insurance Company of America in Newark, N.J. "Review the tests and make sure that you're going for date logic only."

It's likely that you already have most of the tools you need for 2000 testing work. Use them; it will save the time it takes to learn new tools.

"We looked around, and tools that we already had were right for us," says Lon Rinehart, assistant vice president of business analysis at Ohio National Financial Services in Cincinnati. The tools included Compuware Corp.'s Xpeditor and FileAid, which Rinehart already had been using for non-year 2000 testing. An extension to FileAid called DataAger automates the aging of files for various date tests, and a configuration management tool called Chaoge Man from Serena Software International in Burlingame, Calif., helps test how a change affects other applications.

But there also are special year 2000 tools that can save you time and effort. Del Duca uses a code analyzer called Visual 2000 from McCabe & Associates in Columbia, Md., that pinpoints all the dates in a program. "I may have a system with 100 modules but only 20 have [dates]," he says. "I only need to test those 20. You can really cut back on the amount of testing" if you know which modules have dates.

Dedicated year 2000 hardware also can save time and frustration, Dec says. She suggests setting up a limited partition (LPAR, which lets you run mainframe test files as if they were in a separate machine) in the mainframe environment and year 2000 test labs with dedicated servers for a distributed environment. That way, you won't risk crashing your normal test machines, nor will you have to share testing time with non-year 2000 projects, she says.

You also can arrange with your disaster recovery service to use its site for dedicated year 2000 testing.

That lets you do more sophisticated testing than you might be capable of back at the office, and it doubles your testing time by working simultaneously in both locations. "We don't have a separate LPAR, but at the disaster recovery site we can do that," says Mike Pratt, year 2000 manager at Appleton Papers, Inc. in Appleton, Wis. "We're planning to do full Y2K testing, including all the distributed applications and the interfaces to those."

Meanwhile, Pratt's team will be doing date simulation testing for online and batch programs at the office.

Another way to double testing time is the old-fashioned way: work extra shifts. "You definitely don't have enough time if you're only willing to work 40 hours a week," Sanders says. "This late in the game you need to add time on weekends, and we've actually gone to a night shift."

FOCUS, FOCUS, FOCUS

Finally, if year 2000 testing is competing with other priorities, you're wasting precious testing time, says Steve Hugley, senior vice president for information services at Comerica, Inc. in Detroit.

"Every business unit executive has his own business plans he's trying to address at the same time as year 2000 and, unfortunately, they use the same resources," he says.

If other projects need to test, they have to wait. Year 2000 has to have first dibs on testing resources. "That's a biggie and a tough one to do," Hugley says, but "we've got to keep that Y2K focus."□

Melymuka is Computerworld's senior editor, management.

Three levels of year 2000 testing

- **REGRESSION TESTING: checks software that has been fixed to ensure that no new errors have been introduced.**
- **FORWARD-DATE TESTING: checks whether software performs properly by using various future dates such as Jan. 1, 2000; Jan. 3, 2000; Feb. 29, 2000; and so on.**
- **INTEGRATION TESTING: checks whether remediated systems work together properly throughout a department, division, company or among business partners.**

How much testing is enough?

Don't let the auditors and lawyers spook you into trying to test every system. You don't have the time — and it isn't necessary.

"Nobody will be able to test at 100% coverage, but I don't know why anyone would really want to do that," says Matt Hotle, a research director at Stamford, Conn.-based Gartner Group, Inc.

There comes a time when it makes good business sense to stop testing, says Boris Beizer, a senior consultant at Cutter Consortium in Arlington, Mass.

"Every potential failure has a cost," he says. "We stop remediation and testing when the expected gain of further effort is less than the cost."

Even mission-critical systems don't need to be tested to death. Hotle suggests that you dig down into the applications, find the functions and transactions within those programs that are truly critical pieces and test only those.

For example, a mission-critical billing system might include functions that you can't live without, such as invoice generation. It also may include functions you can live without, such as report generation. So test the invoice function rigorously and lay off the reports function.

That's just what Randy Bauer is doing. "We're not testing the use of every piece of data and every system; that would be impossible," says the program manager for the year 2000 project at Toyota Motor Sales USA, Inc. in Torrance, Calif. "We're beginning to focus selectively on mission-critical functions."

Your application experts — the people who developed the system or know it best — can help you separate critical functions from noncritical. Don't set yourself up for failure by attempting to do the impossible.

Hotle asks when Microsoft last delivered defect-free software. "But it's good enough for the marketplace, and that's what you should be aiming for," he says.

— Kathleen Melymuka

YEAR 2000 SCOREBOARD

An occasional series on year 2000 trends, issues and statistics

The value of outside audits

Is your year 2000 project on the right track?

If you're not sure — or if the CEO wants to be sure by the next board of directors' meeting — consider an independent audit of your company's millennium readiness.

Most companies are starting to consider such audits, says Stephanie Moore, year 2000 analyst at Giga Information Group in Westport, Conn. She says some IS executives, and even year 2000 project managers, are calling for audits to make sure they're "doing the right things." But some executive boards are also ordering audits — especially in companies in which the board finds out of touch with the year 2000 project team. "What they're going to find is some projects are far less advanced than they thought they would be," Moore says.

Some service providers are offering such audits, and Moore believes it will be a "big market" within year 2000 work. The audits, she says, can provide "some evidence of due diligence," which would help a company defend itself against year 2000-related lawsuits.

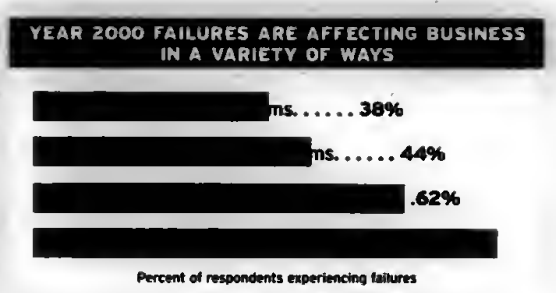
Yet most IS organizations have not considered independent audits. Cutter Consortium in Arlington, Mass., says only 19% of the 280 organizations it surveyed in June had their systems' year 2000 status independently tested, audited or certified. That percentage was up slightly — from 18% — from a study in February.

"With each passing month," says *Computerworld* columnist and Cutter Chairman Ed Yourdon, "the stakes just get higher." — Rick Saia

Off and fixing

In less than nine months, the ratio of Fortune 500 firms that have launched year 2000 fixes has ballooned from one in five to about six in seven, according to a July study done for Cap Gemini America, an IT services and software provider that has year 2000 clients.

But 40% of the companies have already experienced year 2000 failures, the study says, and they're affecting business in several ways.



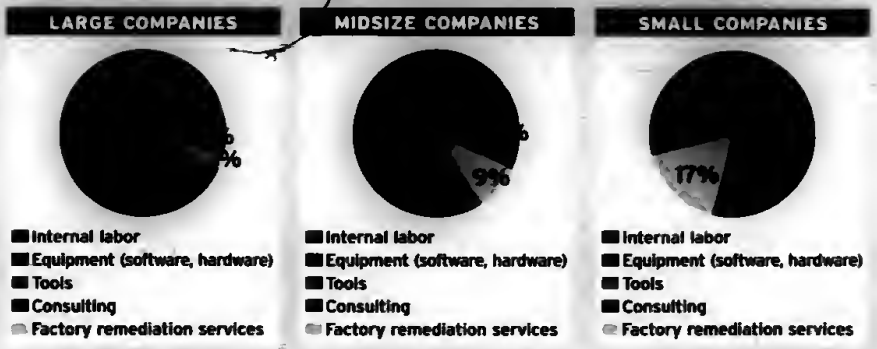
Source: Cap Gemini America poll of 128 IS managers at Fortune 500 firms, conducted by Rubin Systems, Inc., Pound Ridge, N.Y.

Size counts

The smaller the company, the more likely it is to farm out some of its year 2000 work, according to Gartner Group, Inc.

Companies with more than 20,000 employees are spending 10% of their year 2000 budget on outside sources. For midsize companies (2,000 to 20,000 employees), it's 25%, and 46% for small companies (2 to 2,000 employees), Gartner says in a study released this month.

The following charts show how year 2000 spending breaks down, based on company size:



On the bright side

The things a crisis can do for you! About three of every four IS managers see some "collateral benefits" from their year 2000 projects, according to a study by the Information Management Forum (IMF), an Atlanta-based organization of IS executives. The IMF polled 146 executives at three of its meetings late last year.

The benefits managers reported include discovering programs and applications that can be dumped, forcing organizations to adhere to standards for hardware and software on the desktop, and programming standards in the IS shop, says IMF President Jim Jones.

But what about the issue of IT/business alignment? There are two schools of thought.

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TESTING: Every second counts

CONTINUED FROM PAGE 49

The year 2000 testing task is so daunting that it's tempting to get moving immediately. But good, up-front planning can save weeks on the back end.

If your company is a latecomer to year 2000 and you haven't begun to fix date code, how you plan your conversion can make a big difference in testing time. One large insurance company reduced the amount of code it needed to test from 80% to just 10%. It did that by using the "added-logic" conversion method, according to the project manager, who spoke on condition that he not be named.

Rather than expand dates to four digits, the project team added logic to the source code to interpret two-digit dates. Any date less than 50 is interpreted as 20xx, so 12 would mean 2012. Any date greater than 50 is interpreted as 19xx, so 72 would mean 1972. The change works well except with birth dates, the project manager says, and the team developed special logic to handle those. By using the added-logic method, you don't need to change any data files, so you don't need to test the programs that use the data files as you normally would, the project manager says.

If you do change date code in your remediation, don't get carried away and fix other things or you'll have to do more testing.

But chances are you won't have time to test everything, so you'll need to prioritize testing just as you did for remediation. "You have to decide what you have to test and what you're willing to gamble on. But that decision should have been made before. You should be working only on mission-critical systems now," says Jack Sanders, year 2000 project manager at Fina Oil and Chemical Co. in Dallas.

MANAGING YEAR 2000

If you still need to triage for testing, your disaster recovery plan is a good place to start, says David Register, information technology project manager for year 2000 at Pacific Corp., a Portland, Ore.-based power company. "The business units have already said these are the applications we absolutely have to have," he says.

NO COMPROMISE

Having good contingency plans in place for non-mission-critical systems can make you feel less uneasy about not having the time to test them as you'd like, says Steve Jost, project manager of the year 2000 conversion service at Deere & Co. in Moline, Ill. "We are not going to compromise [our remediation process] because time is running out," he says. "For applications that may not get converted in time, we emphasize contingency plans as an alternative."

If you haven't let the remediation team fiddle with nondate code, don't waste time testing nondate logic, says Irene Dec, vice president of information systems at Prudential Insurance Company of America in Newark, N.J. "Review the tests and make sure that you're going for date logic only."

Prudential's Irene Dec says don't waste time testing nondate logic

It's likely that you already have most of the tools you need for 2000 testing work. Use them, it will save the time it takes to learn new tools.

"We looked around and tools that we already had were right for us," says Lon Rinehart, assistant vice president of business analysis at Ohio National Financial Services in Cincinnati. The tools included Compuware Corp.'s Xpeditor and FileAid, which Rinehart already had been using for non-year 2000 testing. An extension to FileAid called DataAger automates the aging of files for various date tests, and a configuration management tool called Change Man from Serena Software International in Burlingame, Calif., helps test how a change affects other applications.

But there also are special year 2000 tools that can save you time and effort. Del Duca uses a code analyzer called Visual 2000 from McCabe & Associates in Columbia, Md., that pinpoints all the dates in a program. "I may have a system with 100 modules but only 20 have [dates]," he says. "I only need to test those 20. You can really cut back on the amount of testing" if you know which modules have dates.

Dedicated year 2000 hardware also can save time and frustration, Dec says. She suggests setting up a limited partition (LPAR, which lets you run mainframe test files as if they were in a separate machine) in the mainframe environment and year 2000 test labs with dedicated servers for a distributed environment. That way, you won't risk crashing your normal test machines, nor will you have to share testing time with non-year 2000 projects, she says.

You also can arrange with your disaster recovery service to use its site for dedicated year 2000 testing.

That lets you do more sophisticated testing than you might be capable of back at the office, and it doubles your testing time by working simultaneously in both locations. "We don't have a separate LPAR, but at the disaster recovery site we can do that," says Mike Pratt, year 2000 manager at Appleton Papers, Inc. in Appleton, Wis. "We're planning to do full Y2K testing, including all the distributed applications and the interfaces to those."

Meanwhile, Pratt's team will be doing date simulation testing for online and batch programs at the office.

Another way to double testing time is the old-fashioned way: work extra shifts. "You definitely don't have enough time if you're only willing to work 40 hours a week," Sanders says. "This late in the game you need to add time on weekends, and we've actually gone to a night shift."

FOCUS, FOCUS, FOCUS

Finally, if year 2000 testing is competing with other priorities, you're wasting precious testing time, says Steve Hugley, senior vice president for information services at Comerica, Inc. in Detroit.

"Every business unit executive has his own business plans he's trying to address at the same time as year 2000 and, unfortunately, they use the same resources," he says.

If other projects need to test, they have to wait. Year 2000 has to have first dibs on testing resources. "That's a biggie and a tough one to do," Hugley says, but "we've got to keep that Y2K focus."□

Melymuka is Computerworld's senior editor, management.

Three levels of year 2000 testing

- **REGRESSION TESTING: checks software that has been fixed to ensure that no new errors have been introduced.**
- **FORWARD-DATE TESTING: checks whether software performs properly by using various future dates such as Jan. 1, 2000; Jan. 3, 2000; Feb. 29, 2000; and so on.**
- **INTEGRATION TESTING: checks whether remediated systems work together properly throughout a department, division, company or among business partners.**

How much testing is enough?

Don't let the auditors and lawyers spook you into trying to test every system. You don't have the time — and it isn't necessary.

"Nobody will be able to test at 100% coverage, but I don't know why anyone would really want to do that," says Matt Hotle, a research director at Stamford, Conn.-based Gartner Group, Inc.

There comes a time when it makes good business sense to stop testing, says Boris Beizer, a senior consultant at Cutter Consortium in Arlington, Mass.

"Every potential failure has a cost," he says. "We stop remediation and testing when the expected gain of further effort is less than the cost."

Even mission-critical systems don't need to be tested to death. Hotle suggests that you dig down into the applications, find the functions and transactions within those programs that are truly critical pieces and test only those.

For example, a mission-critical billing system might include functions that you can't live without, such as invoice generation. It also may include functions you can live without, such as report generation. So test the invoice function rigorously and lay off the reports function.

That's just what Randy Bauer is doing. "We're not testing the use of every piece of data and every system; that would be impossible," says the program manager for the year 2000 project at Toyota Motor Sales USA, Inc. in Torrance, Calif. "We're beginning to focus selectively on mission-critical functions."

Your application experts — the people who developed the system or know it best — can help you separate critical functions from noncritical. Don't set yourself up for failure by attempting to do the impossible.

Hotle asks when Microsoft last delivered defect-free software. "But it's good enough for the marketplace, and that's what you should be aiming for," he says.

— Kathleen Melymuka

502 days until 2000

YEAR 2000 SCOREBOARD

An occasional series on year 2000 trends, issues and statistics

The value of outside audits

Is your year 2000 project on the right track?

If you're not sure — or if the CEO wants to be sure by the next board of directors' meeting — consider an independent audit of your company's millennium readiness.

Most companies are starting to consider such audits, says Stephanie Moore, year 2000 analyst at Giga Information Group in Westport, Conn. She says some IS executives, and even year 2000 project managers, are calling for audits to make sure they're "doing the right things." But some executive boards are also ordering audits — especially in corporations in which the board feels out of touch with the year 2000 project team. "What they're going to find is some projects are far less advanced than they thought they would be," Moore says.

Some service providers are offering such audits, and Moore believes it will be a "big market" within year 2000 work. The audits, she says, can provide "some evidence of due diligence," which would help a company defend itself against year 2000-related lawsuits.

Yet most IS organizations have not considered independent audits. Cutler Consortium in Arlington, Mass., says only 19% of the 280 organizations it surveyed in June had their systems' year 2000 status independently tested, audited or certified. That percentage was up slightly — from 18% — from a study in February.

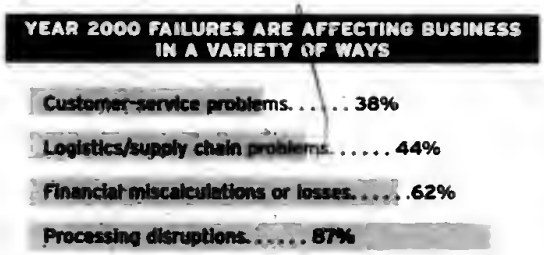
"With each passing month," says *Computerworld* columnist and Cutler Chairman Ed Yourdon, "the stakes just get higher." — Rick Saia

Off and fixing

In less than nine months, the ratio of Fortune 500 firms that have launched year 2000 fixes has ballooned from one in five to about six in seven, according to a July study done for Cap Gemini America, an IT services and software provider that has year 2000 clients.

But 40% of the companies have already experienced year 2000 failures, the study says, and they're affecting business in several ways.

YEAR 2000 FAILURES ARE AFFECTING BUSINESS IN A VARIETY OF WAYS



Source: Cap Gemini America poll of 128 IS managers at Fortune 500 firms, conducted by Rubin Systems, Inc., Pound Ridge, N.Y.

Size counts

The smaller the company, the more likely it is to farm out some of its year 2000 work, according to Gartner Group, Inc.

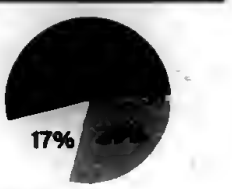
Companies with more than 20,000 employees are spending 10% of their year 2000 budget on outside sources. For midsize companies (2,000 to 20,000 employees), it's 25%, and 46% for small companies (2 to 2,000 employees), Gartner says in a study released this month.

The following charts show how year 2000 spending breaks down, based on company size:

LARGE COMPANIES

MIDSIZE COMPANIES

SMALL COMPANIES



- Internal labor
- Equipment (software, hardware)
- Tools
- Consulting
- Factory remediation services

On the bright side

The things a crisis can do for you! About three of every four IS managers see some "collateral benefits" from their year 2000 projects, according to a study by the Information Management Forum (IMF), an Atlanta-based organization of IS executives. The IMF polled 146 executives at three of its meetings late last year.

The benefits managers reported include discovering programs and applications that can be dumped, forcing organizations to adhere to standards for hardware and software on the desktop, and programming standards in the IS shop, says IMF President Jim Jones.

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ED YOURDON

ARE IN CRUNCH MODE FOR YEAR 2000: HERE'S HOW TO SURVIVE

As summer winds down, many year 2000 projects are entering "crunch mode" — the time when everyone on the team realizes that eight months of remaining work have to be squeezed into the final four months of this year.

This is a dangerous period in any software development project. If managers make the wrong moves, the project and other key team members may walk out the door and doom the project to certain collapse. This is a good time to review past crunch-mode projects that have failed so you can avoid making the same mistakes on your year 2000 project.

For example, it's common for senior management to put more and more pressure on the team, with a great deal of yelling and shouting. The project team often responds by putting in more overtime. And as morale slumps, team members feel unappreciated, insulted and frazzled. The implication is that it's their fault for letting the project get into trouble. Their competence, loyalty, commitment and judgment are questioned by middle and senior managers who weren't in on the project when it began. Sooner or later, someone on the project team (if not *everyone*) is likely to say, "Who needs this? We can make twice as much money at Company X, and they might actually appreciate our efforts."

JUMPING SHIP

Another problem is denial. Even though everyone on the team knows that the project is way behind schedule, with a deadline looming, management refuses to acknowledge it. But the team notices that the Program Evaluation and Review Technique and Gantt charts have disappeared from the manager's bulletin board, the project management files are now security-protected and team members' questions are answered with wishy-washy nonanswers. At some point, someone on the project team is likely to say, "These managers don't want to admit they're cruising on the *Titanic*. I'm getting out before we hit the iceberg."

It's usually far more successful to treat the project team as heroes whose daily efforts are deeply appreciated by everyone in the organization. If they're distracted by paperwork, crowded and unproductive working conditions or bureaucratic nonsense, move heaven and earth to make all the distractions and problems go away.

HOW TO AVOID MUTINY

Muzzle the human resources bureaucrats who insist that the programmers spend an hour each day filling out time sheets. Shoot the furniture police who complain about the way you've rearranged the cubicles. Hire another dozen clerical people to take care of all the paperwork. Cancel all office meetings that have nothing to do with the year 2000. Stock refrigerators with Jolt Cola, fruit juice, candy bars, Twinkies or whatever keeps your programmers going. If you expect the project team to work New Year's Eve weekend next year, as well as the succeeding few weeks, tell them that you'll move their families into the office to ensure their safety should there be massive power failures.

Provide whatever administrative support is necessary to help team members deal with family emergencies, such as sick children and food shopping, so that the team member doesn't have to worry. Give the project leader a separate "morale budget" that can be used to cheer up the team when it gets discouraged by the problems it's facing.

Most of all, let the project team know that everyone in the organization recognizes and appreciates its hard work. If members need to work long overtime hours, the president of the company should deliver pizza to their desks every evening. If the team sees senior managers stroll out of the office at 3 p.m. on Friday to enjoy a golf game and a quiet weekend at home, it's only a matter of time before one of them says, "If this project isn't important enough for them to hang around, why should it be important enough for me to hang around?"

All of that will strike some organizations as excessive. But if you're willing to pay only for business as usual, then the year 2000 project team will operate in a business-as-usual fashion rather than the crunch-mode behavior you really need. □

Yourdon heads the Year 2000 Advisory Service at Cutter Consortium in Arlington, Mass. His most recent book is Time Bomb 2000. *He can be reached via E-mail at ed@yourdon.com.*

MORE ONLINE

For more advice on managing projects and people during crunch times, turn to *Computerworld online* for these past Managing section articles:
▸ Captain of Crunch (Oct. 6, 1997)
▸ Frazzled? Let's Party! (June 16, 1997)
▸ Break out the Champagne! It's a Crisis! (July 15, 1996)
www.computerworld.com/more

f.y.i.

Project managers: 'Corporate athletes'

Project managers perform under physical and mental stresses much like those endured by world-class athletes — and should train accordingly, says Jim Loehr, president of LGE Performance Systems in Orlando, Fla., which helps professional athletes reach their ideal performance states.

Top athletes put themselves under stress during training sessions that may last three to five hours a day, he says. But project managers perform under pressure eight to 12 hours a day and more.

"A project manager is a corporate Olympian. Think like one. Train like one," Loehr told an audience of project managers at a recent Project Leadership Conference in San Francisco sponsored by ABT Corp.

Stress is not something to be avoided, he says. It's a necessary component of achievement, provided you have the mental toughness to channel it. Such toughness is a combination of flexibility, responsiveness, strength and resilience — all of which can be heightened by adopting a training mentality similar to an athlete's. But good performance training also acknowledges the key roles health and happiness play: Achieving a balance in your life is critical, he says.

Loehr recommends a five-part daily training regimen:

1. Mentally prepare every day by prioritizing and organizing, setting goals and expectations and, most important, connecting the day's work to your deepest values and beliefs.

2. Exercise.

3. Eat light — and often. "Grazing" on light snacks every 90 minutes while avoiding big meals stabilizes blood sugar and raises your metabolism, he says.

4. Perform emotionally. It's not what happens, Loehr says, but how you respond to what happens.

5. Recover every 90 minutes. Step outside — anything for a quick break. Stress is the stimulus for all growth, Loehr says, but recovery is when growth takes place.

— Kathleen Melymuka

Executive technology: The latest on smart people. Page 56

Review Center

Storage today/tomorrow

Storage 2001: ORDER FROM CHAOS

Decentralization trend turns back to a more simplified, central approach

BY KEVIN BURDEN

Most people follow trends until the trends get them into trouble. For example, when corporations began decentralizing storage in the 1980s, it seemed a great idea — until they ended up with islands of computing, inconsistent data and networks that choked on their own throughput.

The future of storage is about recentralizing storage, unclogging network arteries and reducing network complexity.

The Internet was the last straw, launching a push back to a centralized approach for storage. Internet technology, including intranets, has raised awareness of what information sharing is all about, and it's a major reason disk-storage needs are growing at a rate of 50% per year at the average company, according to Dennis Casey, an analyst at Strategic Research Corp. in Santa Barbara, Calif. Where users once used networks primarily to pass along E-mail, they now download anything that piques their interest. Those interests may include files fat with images and audio.

Even today, most companies add storage just to compensate for demand. But enough is enough, says Andrew Hargreave, director of technical infrastructure at Geneer Corp. in Des Plaines, Ill. More storage only makes the network that much more difficult to manage and "is succeeding at overloading our servers," he says.

Hargreave may be a typical information technology manager. He wants a simplified network in which it's easy to track and manage storage levels. But he also wants a network that provides fast access, the flexibility to add any type of storage device and the ability to cut

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Storage 2001: ORDER FROM CHAOS

CONTINUED FROM PAGE 53

costs by reducing demand on servers.

We set out to look at how those corporate needs are changing storage technologies and what vendors will offer in the next couple of years.

Storage-Area Network

Analysts say they expect the storage-area network (SAN) to be the greatest influence on new directions for storage technology. A SAN essentially is a pool of storage devices — such as hard disk, tape and optical drives — on a dedicated subnetwork that is shared by all systems on the primary Ethernet network.

To understand how a SAN works, picture a subnetwork within the main network (see chart, at right). That subnetwork, which closely mirrors a typical LAN, solely contains storage devices that operate independently of one another. It is where the enterprise's data is stored. All data traffic stays on the SAN until called by a server; only then is it switched to the client network.

SANs are the future of storage, but they aren't quite here yet. Some of the SAN pieces are available and can give users a taste of the benefits, such as higher throughput and further connection distance with the Fibre Channel interconnect. But you can't put it all together yet.

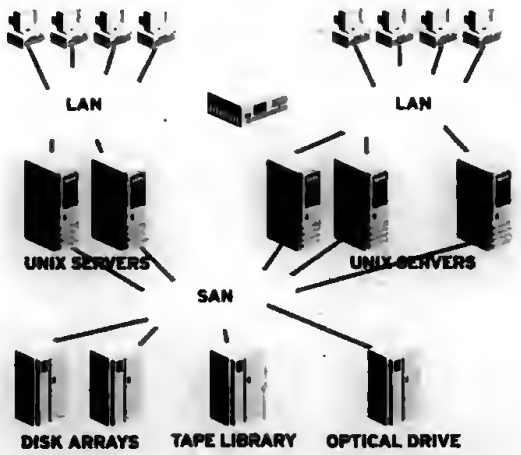
"We're expecting a two- to four-year phase-in by high-end Unix shops first," says Andres Lofgren, an analyst at Giga Information Group in Cambridge, Mass. But the expense of interconnect devices such as routers and hubs required to build SANs will likely hold off typically price-sensitive Windows NT shops longer, according to Lofgren.

Moving storage to its own network satisfies one of the biggest wants of end users: speed. Dedicated, 100M bit/sec. bandwidth for data transfers should give users what they want and at the same time decongest the client network. But what the systems department at First Union Corp. in Charlotte, N.C., finds most compelling is a SAN's promise of flexibility.

Gary Fox, a systems consultant at First Union, expects SANs to drastically change the way he allocates disks to servers. Because servers will share all the storage devices on the SAN, Fox says he expects to better match a system's needs to its most suitable type of storage. "For systems that need fast access to mirrored disk, we'll add an EMC array," he says. "[For] systems that don't need fast access, we'll hang a number of 45G-byte drives off the SAN."

Storage-Area Network (SAN)

Analysts expect that recentralizing storage onto its own dedicated subnetwork will most influence the future of storage



Fox also is looking for the ability to add whatever storage he needs and when he needs it. That's another primary benefit of SANs, according to Tom Lahive, an analyst at Dataquest in Lowell, Mass. You aren't locked into any particular vendor's solution with a SAN, and because storage is separate from servers, "you can buy [whichever] disk array fits your budget at that time," he says.

Cutting costs is always a top priority, but having the flexibility to buy disks from the vendor offering the best deal is only one step toward reducing total cost of ownership. The more significant impact comes from what SANs do to reduce network complexity.

Michael Zanga, senior NT engineer at Greenwich Capital Markets, Inc. in Greenwich, Conn., is already installing Fibre Channel, which lets him design a network in which his NT and Unix servers share storage devices. Zanga says his goal is to consolidate storage so none of it is special to any particular server. "I want to view our storage in the future as just being generic," he says.

Fox sees SANs as a way to free up his servers' expansion slots, which he has been maxing out as he adds storage. "We've filled up all the card slots on several servers because we had to connect them to additional [storage] arrays," he says.

Servers need only a single connection to the SAN and aren't troubled with file-serving duties, so they will likely have longer lives. "And because we will be able to transfer data within the SAN, it will take a load off the [wide-area network] and hopefully prolong the life of a lot of devices," Fox says.

Then there's the ability to scale only as your needs grow. "When your first $30,000 array maxes out, go buy another, as opposed to initially buying a $100,000 array," Lahive says. Vendors say to think of a SAN as a cloud: If you need more storage, just throw in another disk array.

That cloud analogy may be appropriate because right now the SAN isn't much more than a concept. Some of the products are in place but not enough to guarantee all of the promised benefits.

WHAT'S HERE

Switches, hubs, routers and all the interconnect devices for LANs — and, subsequently, SANs — are all available. So are the interfaces: IBM's Escon, the dominant interface for mainframes, and IBM's Systems Applications Architecture are SAN candidates. But it's Fibre Channel that's emerging as the industry-standard SAN interface. And Fibre Channel can be deployed today, although its chip set isn't yet completely optimized to deliver the 100M bit/sec. performance the specification calls for, according to Lahive.

Fibre Channel has some advantages in that it's an outgrowth of SCSI and Ethernet, "meaning it can talk SCSI, the language of file I/O as well as [Internet Protocol] in a single interface," says James Staten, an industry analyst at Dataquest in San Jose, Calif. A more noticeable benefit is the distance it can span. SCSI is limited to 25 meters, but Fibre Channel extends to 10 kilometers.

WHAT'S NOT HERE

There are no standards yet to ensure that servers and storage devices from multiple vendors will communicate. The Storage Networking Industry Association reports it doesn't expect to complete the standards for at least another year.

Also, there aren't any software utilities to manage the hardware devices in a SAN; much of today's management software comes from storage device vendors. "It's what they have used to differentiate themselves in the market," and it isn't prepared to manage other vendors' equipment, says Carolyn DiCenzo, principal analyst at Dataquest.

WHAT YOU CAN DO IN THE MEANTIME

Analysts recommend working on a Fibre Channel infrastructure for now. "You can still reap the benefits of increased distance and performance with Fibre connections now; improved connectivity will come later," Casey says. Switching to Fibre involves replacing the host bus adapter card in the servers and replacing the controller on the storage subsystem. The cost of Fibre Channel is relatively high compared with Gigabit Ethernet, "but it's not cost-prohibitive" like Asynchronous Transfer Mode, Staten says.

Zanga is already preparing Greenwich Capital with Fibre Channel storage and is using its distance advantage to support an off-site server for disaster recovery.

Network-Attached Storage

Network-Attached Storage (NAS) is a technology complementary to SANs that's available today and able to deliver some of the same benefits. Where SANs are for the enterprise, NAS is esseotially a mini-SAN for LAN segments.

A NAS device is a specialized, server that does nothing but serve up files. It attaches directly to the LAN like any other node and is as accessible as a network printer.

Hargreave started implementing NAS devices at Geneer because of their performance and lower cost. "Serving up files isn't complicated. You doo't need a $20,000 server to do it," Hargreave says.

NAS devices also work well for workgroups with extraordinary storage demands. "We're planning on offloading groups that have a lot of PowerPoint presentations onto their own NAS," Hargreave says. Geneer is testing NAS devices in pockets — but won't fully buy in to NAS until management utilities arrive.

Storage Resource Management

Storage Resource Management (SRM) software, which primarily performed backup and recovery and has typically come from storage device vendors, is largely unprepared to manage new environments and devices such as SANs and NASes.

"Now that users are starting to recentralize storage, data backup isn't the problem it once was. What's missing now are tools that can manage a variety of storage devices [for example, tape, optical disk, RAID], and [that have] the means to be proactive, to predict problems before they happen," DiCenzo says.

SRM has always been available on mainframes. Boole & Babbage, Inc.'s SpaceView and Sterling Software, Ioc.'s Vantage remain the stalwarts, but SRM is only starting to emerge for open systems. "And much of what will work for SANs and NASes will come from new companies like HighGround [Systems in Boxboro, Mass.] that are dedicated to SRM," Staten says.

HighGround now has the only SRM product that sets alerts and thresholds and monitors disk consumption for Windows NT, according to DiCenzo. HighGround also is building the standard tool kit ioterface for managing removable storage in NT 5.0.

Although it iso't ready for SAN or NAS environments, HighGround plans to have some products available next year, according to Tom Rose, HighGround's vice president of marketing.

SRM will evolve much as Computer Associates International, Inc.'s CA Unicenter and Hewlett-Packard Co.'s HP OpenView did in the network and systems manageoeot space, a command center that continues to broaden its reach in what it can manage.

DiCenzo says she expects SRM eventually to tie in to the network and systems control. When that happens, more network administrators will likely be managing storage, "and that will be a real shift," she says.

Archives

Retrieving data from traditional archive mediums such as tape and optical disk always has been an arduous process. Unfortunately, the improvements in those mediums have done little to improve data retrieval.

Virtual tape, one of the more notable advancements in tape technology, makes better use of a tape's capacity but doesn't make the data more accessible. Virtual tape systems, such as Virtual Storage Manager from Storage Technology Corp. in Louisville, Colo., and Virtual Tape Server from IBM, use disk arrays to first cache data sets and then stack them as virtual tape volumes. When the volume is full, it's transferred to tape, completely filling its capacity.

Tape's advantage over disk remains its lower cost, but that price edge is no longer enough for some users — especially as the cost of magnetic disk continues to drop, Stateo says.

Fox began archiving to disk when he established a long-range plan to let customers request images of canceled checks over the World Wide Web. "Making it happeo isn't as easy as it sounds, but if we archive on quick-access magnetic disk, we stand a chance. If it's on tape, forget it," Fox says.

Advancements in optical technology from companies such as Quinta Corp. in San Jose, Calif., may further squeeze tape's hold on archiving, according to Jim Porter, principal at Disk/Trend, Inc. in Mountaio View, Calif. Quinta is developing what it calls Optical Assisted Wiochester, which promises to extend the recording density far beyond the believed 40G-bits-per-square-in. limit of magnetic disks.

"The expectation is that [optical assisted technology] will top out at the hundreds of M-bits per square inch," Porter says.

The first products will likely be removable disk drives, Porter says. Quinta won't reveal dates for products, but the company says it expects to draw revenue from the technology within three years.

Disk Capacities

In the year 2001, desktop systems will be sporting 40G-, 60G-, even 80G-byte hard drives. Porter says. He bases his prediction on a conservative estimate that disk capacities will increase by at least 60% per year. The average in the past six years has been 73%.

IBM is paving the way for Porter's prediction. It continues to advaoce the sensitivity of magnetic-head technology to read smaller bits of recorded data, allowing data to be packed more tightly onto a disk.

The areal density — the amount of data that cao be loaded on to a square inch of disk — is about 3G bits today, but IBM's latest Giant Magnetoresistive heads will support 10G bits per square in. and higher. "It's believed that [IBM] can eventually take magnetic recording up to 70G bits per square inch," Porter says. But if capacity does continue to increase at 60% per year, Porter says the physical limit of magnetic disk will be reached within 10 years.

However, hybrid technologies from companies such as TeraStor Corp. in San Jose, Calif., are ready to set new boundaries for disk capacity. TeraStor's Near Field Recording uses a combination of optical and magoetic drive technology to further tighten the recording of data far beyond the capabilities of magnetic disk. "It will eventually record data in the many hundreds of M-bits-per-square-inch range," Porter says.

TeraStor's first drives — which it expects to ship in the fourth quarter of this year — will have capacities of 10G bytes and 20G bytes. A 40G-byte drive will soon follow. Preliminary pricing puts the cost of the 10G-byte drive between $700 and $800 and the 20G-byte drive between $1,000 and $1,200. □

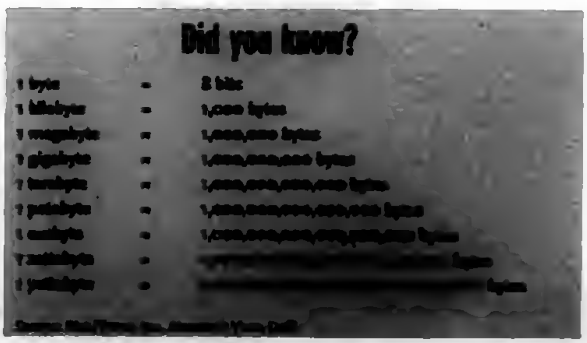
Burden is Computerworld's senior editor, features.

Plummeting prices

Year	Worldwide total disk capacity shipped (terabytes)	Overall average price per megabyte
1988	1,770	$11.54
1992	8,180	$3.00
1995	80,677	$0.33
1998*	772,275	$0.044
2001*	6,141,889	$0.006

* Projected

Source: Disk/Trend, Inc., Mountain View, Calif.



EXECUTIVE TECHNOLOGY

SMART PAGERS

By David Strom

Pagers are the most popular wireless communications devices for several reasons: They are very easy to use, their batteries last several weeks, they are light enough to be carried everywhere effortlessly, and they can receive radio signals deep inside office buildings and outside city centers.

The problem is that most pagers only receive information. But so-called smart pagers can transmit information as well as receive it or match the identity of a message sender with your address book. You can still use them as ordinary alphanumeric pagers and receive callback numbers from telephone users. However, by adding some smarts, you make compromises. Batteries last barely a few days, and smart pagers are heavier — and harder — to use.

Figuring out the options isn't easy. You have to decide whether you plan to roam around the country or stay in your metropolitan area. Each pager has an array of price plans based on message size and quantity. Here's a sampling of devices and service offerings:

PageWriter 2000
Motorola, Inc.
Schaumburg, Ill.
www.motorola.com/pagers
Price: **$330**

SkyWriter
SkyTel Corp.
Jackson, Miss.
(800) 456-3333
www.skytel.com
Typical monthly usage fee: **$50 to $100**
Also available on PageNet as a two-way service

If you're looking for true nationwide roaming with a small device that has reasonable battery life, consider SkyTel's SkyWriter service using the Motorola, Inc. PageWriter 2000 pager. The pager weighs 7 ounces and has a 10-line screen on the top half of a clamshell-like setup. The keyboard isn't for touch-typists, but it's fine for sending one or two sentences.

SkyTel offers nationwide coverage and roaming. However, in my tests I found that some pages took hours to reach me when I roamed far from home. Part of the problem is that PageWriter has two radios: One uses the same network for receiving pagers; the second is used for transmitting messages. Both SkyTel and Paging Network, Inc. are still building their networks to handle the sending side from the pager. PageWriter has an optional Lotus Notes client. You can set up this client to forward only messages from a certain person or ones containing a special phrase or to transmit all of your messages. Using a special cradle, the battery typically needed recharging after four to six days. And the battery gauge on the main menu of the device is somewhat misleading: It could drop from "100%" charged to partially charged almost instantly.

Interactive Pager
BellSouth Wireless Data
Woodbridge, N.J.
(800) 726-3210
www.bellsouthwd.com
Price: **$430**
Typical monthly usage fee: **$35 to $60**

BellSouth's Interactive Pager is three-quarters of an inch taller and several ounces heavier than PageWriter. Its screen is smaller (with only a four-line display) and its menus far more confusing. It also has a smaller coverage area than SkyTel's service. It comes with two sets of batteries: a rechargeable and two replaceable AA batteries. A charge will last one or two days. The rechargeable battery remains inside the device. The AAs augment this battery and need weekly-or-so replacement. Its keyboard is awkward for typing numbers.

This pager had a few advantages, however. First, it had more reliable transmissions, with no garbled characters either sending or receiving in my tests. The other pagers had trouble with their transmissions. Second, you can send a text message to anyone with an ordinary phone number. The message is transferred to a speech synthesizer and delivered. That's handy. Finally, it had the quickest delivery of any device. Messages came within minutes.

Synapse Pager Card for PalmPilot
PageMart Wireless, Inc.
Dallas
www.pagemart.com/personal/palm.html
(800) 864-4357
Price: **$189**
Typical monthly usage fee: **$45 to $75**

Unlike the first two pagers described here, the Synapse is just a one-way device. But it solves two problems. First, for those of you who carry a PalmPilot organizer, it saves space, because the pager is a small circuit card made by Motorola that replaces the memory card of all PalmPilots, other than Version III. Second, if you've ever received a page with an unfamiliar phone number, you'll appreciate that Synapse works with your contact database stored in the Pilot to match the incoming phone number on the page with the corresponding name in your address book. However, I found that unless the phone number was the first series of digits on a page, the software wouldn't match it with my contact database. Installation was a snap. You replace cards and reset your Pilot and resynchronize your data from a PC.

There were disadvantages. First, roaming is nationwide but not effortless. You need to make a phone call to PageMart's service bureau and enter the area code of your new location. Second, this pager had the most trouble with garbled and missed messages. When that happens, you can call PageMart and have the messages read to you. □

Strom is a freelance reviewer in Port Washington, N.Y.

PAGERS ARE POPULAR

Analysts such as Darryl Sterling at The Yankee Group estimate that, out of more than 45 million pagers in use today, approximately 61,000 are smart pagers. Sterling predicts the number of smart-pager subscribers will jump to about 8.8 million by 2003.

In the meantime, "People buy pagers for a lot of reasons," says David Wellmuenster, an independent communications consultant. "They want long battery life so you can forget about worrying when to change your battery. They also want something small, to fit in your pocket."

Smart pagers will see more innovation, including Windows CE and PalmPilot-style devices with wireless peripherals, and smarter phones from Samsung and others that come with built-in World Wide Web browsers and data services.

CELL PHONES AND PAGERS

Why bother with smart pagers when you could use just a cellular phone? There are several reasons:

If you need up-to-the-minute contact with your staff and E-mail is a preferred means of communication, you can use these pagers to compose replies. Pagers can also come in handy when sending out alerts from your information systems staff, for example. And if your corporate E-mail system is Notes, then PageWriter — with its optional Notes client — can provide instant notification of incoming messages.

COMPUTERWORLD

In Depth

MANUELO PAGANELLI

By Deborah Radcliff

IN FEBRUARY, THE INFORMATION systems department at Sonoma State University in Rohnert Park, Calif., learned that child pornography was being stored on a server somewhere on campus.

The tip-off message to IS included the exact IP address. In Sonoma State's system, each IP address is associated with a specific port. This one was a direct Internet connection in a dormitory. The IS staff captured images flowing into and out of the port before university police made the arrest.

"It only took us a couple of hours to catch the guy," says Sam Scolise, Sonoma State's information technology director. "But it was a very depressing day for our staff because of the horrible things they saw."

Sonoma State received its initial tip from what some might consider an unlikely source: a Swedish hacking group.

In the battle against child pornography, one of the authorities' best allies turns out to be hackers, the ultimate haters of authority. Although police won't acknowledge them publicly, some hacking groups informally assist law enforcement agencies in both technical training and evidence gathering.

U.S. Customs, the Federal Bureau of Investigation and other agencies have set up undercover units to combat child pornography. But because of limited funding and scarce technical resources, they fight an uphill battle. Customs experienced a 185% jump in child pornography cases last year alone — yet has only three agents dedicated to working them.

"There's so much out there. It's impossible for agents to keep up," says Senior Special Agent Don Huycke, national program manager of U.S. Customs' child pornography en-

AS THEY FIGHT ONLINE CHILD PORNOGRAPHY, LAW ENFORCEMENT AGENCIES GET HELP FROM AN UNLIKELY SOURCE: HACKERS

UNEASY PARTNE

forcement program, which has its headquarters in Sterling, Va.

From October 1996 through April 1998, U.S. Customs made 403 arrests related to the interstate transport of child pornography, including 175 last year alone.

Although the FBI got a later start, its caseload mushroomed during the same period. Since its inception, the FBI program has resulted in 407 searches and 192 convictions against people who use online services to recruit children into illicit sexual relationships and those who distribute pornographic images of children.

With miniscule funding, volunteer hacker groups have an even harder time keeping up. "When we started in summer 1997, we got inundated quickly with people saying they found terrible sites and would we please check them out," says 21-year-old hacker and college student "RSnake," who heads the 15-member Ethical Hackers Against Pedophilia (EHAP) group from his Northern California apartment.

"We were working eight hours a day on this, and our database grew so quickly we looked for donors to give us space," he says.

THEIR OWN GAME

Hackers and police alike try to beat pedophiles at their own game by trolling the Internet posing as teens. These are the same tactics used in the real world by law enforcement agents such as U.S. Postal Inspectors.

Once images are passed or other obvious evidence of pedophilia is observed, investigators try to talk perpetrators into offering personal, identifying information. Failing that, they wait for suspects to set up a face-to-face meeting. "The moment they cross state lines for the purpose of engaging in sex with a minor, they see five or six agents instead of a 14-year-old," says FBI Special Agent Larry Foust.

If they can't lure suspects, investigators use proprietary technology and investigative techniques to electronically track and trace byte trails, either to pedophiles' personal machines or to the servers that house the images.

Even when agents complete such traces, they often find the server space pirated from a legitimate business that has no knowledge of what is stored there. Agents say that makes it even more difficult to find the actual owners of the child pornography.

RSnake says he has passed on tracking programs and training materials to law enforcement agencies. Another group, *www.pedowatch.com*, offers a free, downloadable tool called Digger Engine, along with detailed techniques to trace Internet Relay Chat users and Usenet posts.

The uneasy relationship between hackers and law enforcement has come with a lot of hard knocks. RSnake says he made a few blunders in the beginning, but that he and his 14 cohorts have now learned to do their sleuthing within the boundaries of the law.

FEDERAL TRAINING

Agents and officers also receive training from a Sacramento, Calif.-based organization called System for Electronic Analysis and Retrieval of Evidence, or Search. The group is funded by a grant from the U.S. Department of Justice.

"We teach investigators how to go undercover and identify where these pedophiles hang out — basically, how to patrol cyberspace," says Fred Cotton, Search's director of training. "The Internet is one big network. These perps have got to be somewhere."

But Search conducted only two classes dedicated to online child pornography last year. Cotton blames this on a lack of funding and human resources.

U.S. Customs was the first agency to take action against online child pornography during the bulletin board service craze in 1989. But no one in Huycke's tiny department knew how to investigate bulletin board service cases. Mostly, they just watched them for posted images.

In 1992, the department caught a break in the form of a perpetrator who talked a lot. He showed Huycke's agents the hot bulletin boards and how to receive images electronically. "We didn't have any way to learn this without the bad guys showing us," Huycke says.

MONEY AND PEOPLE

The FBI's fight against child pornography received a $10 million budget allocation from Congress a year and a half ago, which was used to increase staff to 60 agents.

But U.S. Customs and most local agencies sorely lack human resources, training and funds. And because they receive absolutely no outside funding, hacking groups are dropping like flies. Last year, Southern California-based Hackers Against Kiddie Porn folded. According to RSnake, EHAP isn't far behind.

Law enforcement agencies and hacker groups agree that what's really needed is a permanent budget increase and more educated and technically trained investigators. They also urge parents to find out what their kids are doing on the Internet and control children's access privileges. Sonoma County Prosecuting District Attorney Gary Medvigy says, "The more people volunteer as pedo-watchers and the more parents who put on software blocks to protect their own kids, the more it will help us deal with this problem."

It was Medvigy who prosecuted Noah Alan Pal, the 19-year-old who was caught using the Sonoma State server.

In May, Pal pleaded guilty to possession of child pornography. In July, he was sentenced to eight months in jail, psychiatric evaluation, forfeiture of his computer and three months' probation.

"The university's IT department did a great job," Medvigy says. "And I think it's great that hackers, with their talent, report these sites to law enforcement." □

Radcliff is a freelance writer in Northern California. Her Internet address is derad@aol.com.

IT Careers

VIOLENCE in the

By Rochelle Garner

WE LIVE IN A VIOLENT WORLD, where aggression can burst upon the unwary on the roads, in our schools and in the workplace. A mark of that aggression: According to a report released by the International Labour Organization (ILO) in Geneva, homicide is the leading cause of death on the job for American women and the second-leading cause for men. An average of 20 murders occur at work every week in the U.S.

The ILO warns that acts of violence can occur in any workplace, anywhere. No company, no department is immune — least of all information technology organizations.

Connecticut Lottery Corp., for example, was a bastion of white-collar workers. Onetime-accountant-turned-killer Matthew Beck had been demoted to data processor — his duties shifted to the IS department — before his shooting rampage began.

What set Beck off, experts say, was his perceived mistreatment by management: A 1996 job change into the IS department should have included a $2-per-hour raise, he believed. Although lottery officials had agreed in January that Beck had been performing work outside his job classification, negotiations continued into March on how much the company owed him.

"People who commit violent acts are trying to regain control," says Gary Salmans, vice president and risk manager at Sedgwick of Colorado, Inc., a Denver-based insurance brokerage firm.

"There's always been stress in the workplace, but the higher the use of technology — as a means of communication, as well as just sitting in front of a computer all day — the more violence-prone we seem to become," says Salmans, who counsels companies on violence prevention.

That doesn't mean that computing technology promotes violence. Nor does it mean that technology organizations, per se, are at special risk. What it does mean is this: Today's undermanned and overstressed technology staffs often work in isolation. Face-to-face conversations tend to happen in hallways, rather than sitting around the lunchroom, which provides fewer outlets for staff members to vent their frustrations. Colleagues and managers turn to E-mail as the preferred form of communication, with little regard for tone.

The result? A noncaring atmosphere. Employees are increasingly being thrown into corporate cultures that exacerbate or condone hostile behavior. Add the inability of some individuals to deal with anger and poor management practices that promote perceptions of injustice. Mix the two, and you cook up a combustible stew. Such ingredients are not unique to IT organizations — they're just too prevalent for IT's own good.

"People's penchant for hostility is about their inability to cope with adversity, and can't be associated with a particular type of industry or job. The problem is no worse for technical workers," maintains Coeta Chambers, human resources attorney at Intel Corp. in Santa Clara, Calif. Chambers, as a member of Intel's Workplace Response Team, helped write the company's guidelines on dealing with hostile behavior.

Chambers is right — despite shocking incidents at the Connecticut State Lottery this year and at ESL, Inc. in Sunnyvale, Calif., 10 years ago. In the latter incident, an ex-employee blasted through company doors to get at a former colleague he'd been stalking. Other work environments more likely to feel the stings of murderous hostility include health care, late-night retail stores and law firms, according to the ILO.

Still, workers killing colleagues represents only 3% to 5% of workplace violence, experts say. Far more prevalent acts of intentional harm include fighting, biting, bullying, shouting and vicious gossip. The key word is "intentional." We're not just talking about unthinking rudeness. It's behavior that's calculated to do damage.

"There is a wide range of aggressive behaviors that can harm people physically and psychologically — as well as the company's bottom line," says Dr. Joel H. Neuman, director of the Center for Applied Management

Time line of a killing spree

▸On March 5, 1998, Matthew Beck complained to coworkers that his bosses weren't treating him fairly. He'd been "demoted" from accountant to data processor at the Connecticut State Lottery in Newington. Executives were stalling, he said, on settling a workplace grievance he'd won. He also had been forced to take a five-month, stress-related absence.

▸Returning from that absence four days earlier to work in the lottery's information systems department, Beck, 35, had found his new, smaller office strewn with paper. Now he added another complaint: He had nothing to do. Beck reportedly told a colleague he "didn't have the strength" for such a mindless job.

▸The next day, Beck finally settled the score. He marched into his cubicle at 8 a.m. that Friday, his freshly shaved head gleaming under the fluorescent lights. Beck picked up the phone to locate the lottery's director of information services, chief financial officer, vice president of operations and administration, and president.

▸Beck approached the lottery's 33-year-old head of IS and stabbed him in the chest and stomach with a butcher knife. Then he shot him at point-blank range.

▸Next, Beck strode into a meeting, singled out the 38-year-old CFO and bid her "bye-bye." He then pumped three bullets into her from his 9mm semiautomatic pistol.

Turning on his heels, Beck stalked the hallway to gun down the 40-year-old vice president of operations and administration.

▸Finally, Beck chased the lottery's president, 54, to a parking lot. Overtaking him, Beck shot him three times. As police closed in, Beck turned the gun on himself. All four victims, and Beck, died from their injuries.

"This was not a shock," a shaken coworker told the *Hartford Courant*. "He was a bomb, and they lit the fuse."

— Rochelle Garner

MORE ONLINE

For more on how to prevent violence and links to violence-prevention resources, visit *Computerworld online* at:

www.computerworld.com/more

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IT WORKPLACE

at the State University of New York in New Paltz.

"The FBI lists three types of exposure to violence by industries, with Type 1 having the potential for robbery and Type 2 being those that can be threatened by angry customers," says Beth Lindamood, senior analyst at Great American Insurance Cos. in Cincinnati. "The computer industry falls into Type 3 — which is the most difficult to predict."

That third source of potential danger includes disgruntled employees and ex-spouses. "The danger signs can come out by asking the right questions in the interview process," Lindamood says. "Listen for why someone left a previous job. Was it a supervisor always stealing this person's ideas or always promoting someone else? It's especially revealing if that person has problems with authority figures."

Conduct unbecoming

According to the FBI, the profile of a person most likely to "go postal" is a white male, between 30 and 40 years old, with a keen interest in guns. Chances are you know some people who fit that all-too-vague description, so the U.S. Department of Justice has added the following warning signs to that profile:

- Someone who holds irrational ideas and beliefs.
- An employee experiencing exceptional stress outside of work, such as a divorce.
- A person who is fascinated by weapons.
- An employee who displays unwarranted anger.
- A person who can't take criticism.
- Someone who expresses a lack of concern for the safety of others.

Such warning signs paint a picture of a worker who not only can't get along with others but who actually prefers being solitary. The trouble with applying that profile to an IT organization: It describes the stereotypical software geek — unwilling or unable to interact with fellow humans. Even worse, by the time you notice an employee exhibiting three or four of these indicators, he may already be close to extreme action. □

Garner is a freelance writer in San Carlos, Calif.

Tips for cultivating a violence-free IT staff

1. Don't hire the misfits. Check references, look for gaps in resumes. True, companies aren't required to supply more than dates of someone's previous employment. But the reference you call may feel morally compelled to tell you about certain behavioral problems.

2. Don't keep the misfits. If you see they don't get along with others, or if they are pathological blamers, get rid of them before it escalates.

3. Match people's personalities and skills with the right jobs. Don't put people with a supervisor they can't stand. That exacerbates a bad situation.

4. Communicate. Listen to employees. Explain things to them — in person. Don't rely on E-mail for smoothing out disagreements.

5. Consider counseling. Make sure your company has an anonymous employee assistance program. That gives staff an outlet to vent frustrations. In particularly egregious cases, insist that employees avail themselves of that counseling.

6. Maintain a fair grievance procedure. Give employees an avenue to complain. And make them feel that, even if they don't get the answers they want, their voices were heard.

7. Extend courtesy. Treat employees as you would treat customers. Don't reprimand an employee in public. Don't permit one person to harass another.

8. Watch for the little things. You'd be amazed how a dirty bathroom can cause someone to blow.

9. Act consistently and fairly. Apply the same standards to everyone — from your favorite employee to the department's problem child.

10. Effectively prohibit guns and drugs in the workplace. This will remove the cause and the means of violence.

Source: Keith Black, an attorney at Blank Rome Comisky & McCauley LLP in Philadelphia

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Software engineer with 2 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 1 year of experience using Visual C++, MFC, Windows 32 SDK, Windows NT, and GUI. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields: engineering, mathematics, computer applications or physics. $67,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 5019811, to Mr. Richard Iritzcsko, ACTG. MGR. Beaver County Job Center 120 Merchant Street, Ambridge, PA 15003.

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REGIONAL SCOPE

Upstate New York

ROBBING the CRADLE

By Kim Fulcher Linkins

POSSIBLY FOLLOWING the example of professional sports teams, information technology organizations seeking qualified individuals in upstate New York are offering positions to some students who have yet to finish college.

"I've talked to people at Syracuse University, and every single one of their computer science people have multiple offers," says a technical recruiter in Buffalo.

"What Cornell is finding now is that a lot of the tech companies are recruiting their computer science students as sophomores and juniors and telling them, 'Why waste two more years in college? Come work for us now, and we'll pay you $50,000. We'll give you a $10,000 sign-on bonus, and we'll pay for your college,' " the recruiter says.

This is a sensitive subject, so most recruiters won't identify themselves when they talk about luring away college students. But some experts advise computer science students to go for it. "A company out of Pittsburgh was saying, 'You can go to to Carnegie Tech or Duquesne or Pitt, or one of the schools here. We'll put you through college at night. Why waste two years in college?' Just like the basketball players," says a technical recruiter.

IT managers and technical recruiters in upstate New York advise prospective IT professionals to look at every aspect of a job before deciding which offer to accept.

"Look for all of the opportunities that are out there. Look for companies that are going to train you," says a technical recruiter in Buffalo. "Don't be so worried about the salary right now or things like that, but instead [think about] making yourself more valuable down the line."

"In this industry, almost unlike any other industry, you're almost training daily," the recruiter says. "Not necessarily by formal training, but just by doing your job. A lot of times it's something you haven't encountered, but you solve that problem, and then the next time, there's nothing to it. It's a matter of finding the right opportunity and not worrying about how much you're making now but making yourself more valuable . . . and getting with that company that really puts the stock in you."

Because the current IT market is one in which demand for qualified professionals is high and the supply is low, IT professionals can have the luxury of looking around a little when trying to find the right employment opportunity. IT managers suggest they do just that.

"From a candidate's perspective, it really has to be the environment that they are comfortable in," says Dan Canzano, vice president of IT at Paychex, Inc. in Rochester. "With a technology background . . . you have the opportunity to select a team that you want to be part of. Is it a healthy organization? Does it have a career opportunity? What kind of technologies are being implemented by the organization? Is it something that you're interested in and will [provide] an opportunity to grow?" □

Linkins is a freelance writer in Austin, Texas.

GO WHERE EVERYBODY KNOWS YOUR NAME

AS YOU MIGHT EXPECT, upstate New York offers a more friendly, casual atmosphere in which to work and live than downstate near New York City, information technology experts say.

"I think every business is business-casual dress," says Bill Parker, chief information officer at Agway, Inc. in Syracuse. "We're a pretty friendly group of people up here," and it's not a really fast-paced environment, he says.

"It's kind of the small New York City," says a Buffalo technical recruiter. "If you like New York, but you don't like New York City, then Rochester and western New York is a great place to be — kind of that country/city atmosphere."

Dawn Tobin, a technical recruiter at Tobin & Associates, Inc. in Rochester, says major employers in the area also lend the region an "international flair."

"Eastman Kodak [Co.] and Bausch & Lomb, [Inc.] have their world headquarters in Rochester," Tobin says. "We have a large division of Xerox [Corp.] in Rochester, and then also the smaller businesses that are here are doing a lot within the U.S. and also outside the U.S. So the international capacity certainly brings a lot to the table," Tobin says.

In addition to ample salaries, sign-on bonuses and stock options, many IT professionals in upstate New York are seeking nonmonetary compensation as part of their benefits packages.

"Work at home is a big thing," says Tom Labrake, assistant vice president of MIS at Blue Cross/Blue Shield of New York in Syracuse.

Experts say working at home and working part-time with benefits are very popular employment options.

Other popular nonmonetary compensations include flex-time arrangements in which employees set their own schedules, and ongoing training, in which companies pay all or part of an employee's training and certification in new and expanding technologies. □

— Kim Fulcher Linkins

TOP IT DEMAND IN BUFFALO, ROCHESTER, SYRACUSE, ALBANY

YEAR 2000 CREATES FORMIDABLE NEED FOR IT PROS

With the millennium fast approaching, information technology professionals with year 2000-related experience are in constant demand. The IT professionals most in demand in upstate New York include the following:

- **Cobol programmers**
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- **PowerBuilder developers**
- **Client/server developers**
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- **Desktop support**
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- **Any and all programming languages**
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- **Project management**
- **Managing third-party software**
- **Fourth-generation language skills**
- **Application development**
- **Graphical user interface tools**
- **Implementation**
- **Network integration**

Beyond that, experts say the most valuable employees are those who have people skills in addition to a wealth of technical experience.

Employers are looking for candidates who have a customer-service orientation, can "keep people at ease" and "have that good personality to kind of sway the frustration," says a technical recruiter in Buffalo. They value employees who can "get rid of that frustration, lighten the atmosphere and solve the problem," he says.

— Kim Fulcher Linkins

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Primarily responsible for the architectural design, development and maintenance of all M&T Bank Corporations Data Security at the enterprise level. In addition, you will manage the Systems Assurance Group, and handle administrative responsibilities for Contingency Planning staff.

To qualify, you must have 5 years of Data Processing experience (two in a managerial role), and a working knowledge of computer security techniques with a demonstrated background in project management and policy/procedure development. Experience with multiple types of platforms, PC/LAN environment security, and Internet firewall/access security also required. **RESPONSE CODE: SAM**

SYSTEMS ANALYST

You will assist in defining user requirements by designing, programming, testing and implementing required system/program changes. In addition, you will program in COBOL, perform analysis and design for COBOL applications, act as lead or co-lead project manager, and provide technical direction to other resources.

To qualify, you must have a Bachelor's degree in Computer Science and equivalent experience. Standard IBM developmental credentials (MVS operating system, JCL, VSAM, COBOL, COBOL II, etc.) for mainframe development positions, distributing processing experience (client/server, Visual Basic, C++, GUI, LAN/WAN, PowerBuilder, etc.) for PC development positions. **RESPONSE CODE: SA**

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To qualify, you must have a Bachelor's degree (MBA desired), 3-5 years in database programming, including SAS proficiency. **RESPONSE CODE: SMA**

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You will provide technical and operational support installing mainframe system products, and you will program/document complex tasks and projects relating to enterprise printing and report delivery.

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SR. NETWORK COMPUTING ANALYST

You will perform analysis, design, research and development for business unit initiated or internally generated infrastructure related projects. You will manage projects to include client/vendor/peer meetings, resource coordination, project plans and budget planning. You will also develop and present recommendations for projects and processes.

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OPERATIONS ANALYST

You will assist in analyzing and ensuring operational efficiencies for Data Processing, providing support for new and modified applications. In addition, you will assist in the maintenance of all automated systems.

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Senior Consultant needed for computer software firm located in Lake Brook, Illinois. Job duties include: Perform network management for 3000 users including bridges, routers, gateways, hubs and concentrators. Hardware and software system configuration, new networking technology appraisal and FDDI and ethernet performance tuning. Manage a team of consultants and the technical recruiting functions. Use UNIX, TCP/IP, X11, VMS, NT and JAVA. Applicant must have B.S. degree in computer science, math, business, electronic engineering or industrial studies. Applicant must also have 2 yrs. exp. in the job duties described above or as a Programmer/Analyst, Systems Analyst or Technical Manager which includes 2 yrs. exp. in hardware and software configuration including bridges, routers and gateways and 2 yrs. of TCP/IP and UNIX. 40hrs/wk, 9:00 am - 5:00 pm, Mon-Fri, $60,000/yr. Send 2 copies of both resume & cover letter (NO CALLS) to Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, Illinois 60605, ATTN: Lydia Tullis. Ref# V-IL 19130-E. Must have proof of legal authority to work permanently in the U.S. AN EMPLOYER PAID AD.

Systems Analyst (Principal Consultant) Develop & implement operational support systems (eg. financial, manufacturing & human resources management systems) based on Oracle RDBMS & 4GL application dev tools. Analyze clients' Business Information Flow requirements using CASE, formulate enterprise models, & design & develop custom applications. Lead small project teams & mentor more junior consultants. More than 70% travel to client sites throughout the USA & temporary relocation may be required. Must have Bachelor's in Computer Science, Engineering (any field) or Information Systems & 5 years progressive experience in analysis & development of business or manufacturing applications using Oracle RDBMS technology in a C/Unix environment. $4,825/mo. Apply at Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701. JO# TX0041066 Ad paid by as Equal Opportunity Employer

Data Acquisition Specialist. Research, test, design, implement, and support database management applications for customers. Requires minimum of B.S. degree and 1 yr Experience as Data Acquisition Specialist or 2 yrs. experience in database management or satellite systems management experience. 40 hrs./wk. 8:00 a.m.-5:00 p.m. $27,497.00 per yr. Applicants should send resumes, with social security numbers, to: Indiana Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attn: Mr. Gene R. Replogle, I.D. #34507783.

SENIOR SOFTWARE DEVELOPER Designs and develop three-tiered custom applications and develop technical infrastructure to support client/server needs. Build and manage commercial databases in distributed UNIX environment. Recommend and implement data recover and backup strategies, maintain data structure, database performance tuning and testing. Requires M.S. in Computer Science. Must have 2 years experience in job offered or 2 years experience as Programmer Analyst, DBA and/or Systems Engineer including Oracle database design, development & administration. Demonstrated knowledge of the design and implementation of heterogeneous systems as well as knowledge of Oracle tools (SQL*Forms, SQL*ReportWriter, SQL*Net, SQL*Loader, SQL*DBA, SQR Report Writer, TCP/IP, UNIX shell programming and C. Salary: $61,000.00/yr. 40 hrs/wk (9 to 5) Must have proof of legal authority to work permanently in the U.S. Respond to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605. Attention: Brenda Kelly, Reference # V-IL 18825-K, AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

Instructor/lab coordinator for 40 hours per week from 9:00 A.M. to 5:00 P.M. Rate of pay $19.45 per hour. To provide computer lessons to various classes including instruction in English and Romanian in computer room using Word Perfect, DOS, Windows 3.1, Windows 95, Winfax and Procom communication and internet technologies including FTP and E-mail; private computer programs for school administration in C and Pascal, design and maintain an Internet home page, provide on-site maintenance and support of computer hardware and software in school; create and maintain the school's Local Area Network (LAN) using Microsoft and Novell net working. Education requirement: Bachelor's degree with major field of study in Computer Science. Experience required one year in the job offered or one year in a PC support specialist. Prior experience to include Word Perfect, Excel, DOS, Windows 3.1 and Windows 95, Microsoft and Novell networking, Winfax and Procom communication, Internet technologies including FTP and E-mail. Must be able to program in C and Pascal, must be fluent (read, write, speak) in English and Romanian. Must have proof of legal authority to work permanently in the U.S. Send resumes to Illinois Department of Employment Security, 401 S. State Street - 7 North, Chicago, Illinois 60605, att: Lindsey, reference No. V-IL 16342-L. An employer paid ad. No calls-send 2 copies of both resume and cover letter.

Systems Analyst to analyze data processing requirements; design data classes & variables & data dictionaries; design user interface screens & menus using screen generators; code & implement data processing programs using C/C++ language compilers & develop tool kits available under MS-Windows environment; system/application products; design/code of interfaces in ABAP/4 in sales & distribution, material management/production planning & finance modules in SAP s/ware package; design/code remote communications using C/C++, UNIX Shell Scripts & OLE in SAP under client-server environment; test & implement interfaces. Reqs. Bach. in Comp. Sci., Computer, Electrical, Electronics or Mech. Engg., Comp. Info. Systems, Math or its educ. equiv., 1 yr exp in job offered or 1 yr related exp such as Systems Analyst/Programmer or SAP Consultant. Related exp must include d/base design, user interface design, coding, testing & implementation programming using ABAP/4 (SAP) C/C++, MS Visual C/C++ in client/server, Unix environment; $66K, 40 hrs/wk 8a-5p. Must have proof of legal authority to work permanent in US. Send 2 copies of both resume & cover letter (no calls) to Illinois Dept. of Employment Security, 401 S. State St. - 7 North, Chicago, IL 60605, Attn: Brenda Kelly, Ref #V-IL17660-K "Employer Paid Ad"

Quantitative Marketing Consultant: Acquire data from clients, private sources, and data vendors pertaining to the pharmaceutical and health care industry; analyzing data for sales and marketing purposes including sales force sizing and structuring, sales force compensation resource allocation, account profiling, segmentation and targeting, managed care plan selection and rebates, and multi-channel investment optimization and breakout; designing software to run simulations for marketing purposes using Artificial Intelligence, Theoretical Marketing, and Operations Research techniques for pricing, forecasting, portfolio analysis, new product launches, partnership planning and deal valuation. 40 hrs/wk, 9am - 5pm, $70,000/yr. Minimum Requirements: Masters in Artificial Intelligence or Computer Science + 1 year experience required to the job offered or as a Consultant. Experience must include creating Artificial Intelligence, Theoretical Marketing, and Operations Research models. Must have completed coursework in applied statistics, price and markets, economic analysis, field studies in international markets, financial accounting, and entrepreneurial growth. Must have proof of legal authority to work permanently in the U.S. Submit 2 copies of both resume and cover letter to the Illinois Department of Employment Security, 401 S. State Street - 7 North, Chicago, IL 60605. Attn: Brenda Kelly, Ref. #V-IL 16147-K. An employer paid ad. No calls.

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SOFTWARE ENGINEER Design, implement and test Network Management module for TCP/IP based Local Area Networks. Must have demonstrated ability in C/C++ and UNIX; demonstrated ability in UNIX interprocess communication and socket programming, and demonstrated ability in TCP/IP and network management using SNMP. Must have Master's Degree and 2 years experience in job offered or in software development. 40 hrs/wk, 8am-5pm, $75,000/yr. Send 2 resumes to Case #72258, PO Box 8968, Boston, MA 02114.

System Administrator in Miami, FL. Provide administrative services for UNIX, Oracle databases including upgrades, tuning, monitoring, backups, & user support. Support user req for Just In Time reports using Structured Query Language. Must have exp. in Networking, Digital Unix, Oracle database admin. Min BS in Bus. Admin., 2 yrs exp. in job offered. 8am-5pm, 40hrs/wk, $41,683/yr. Send resume to the Dept. of Labor/Workforce Program Support, PO Box 10999, Tallahassee, FL 32302 Attn S. Clark, RE: JOFL#1830030

SOFTWARE ENGINEER wanted F/T by Internet Advertising Co. in NYC. Must have 3 yrs exp installing, testing, monitoring, troubleshooting & repairing intranet & UNIX envrnmts and developing prgms using C++, Oracle, Java Script, HTML, Perl & COBOL. Bachelors in Comp Sci reqd. Apply to: HR Dept., DoubleClick, 41 Madison Ave., 32nd Flr, New York, NY 10010.

BAY SEARCH GROUP

Project Leader. Lead software development team for design, development, implementation, & testing of various software design and development projects using Visual C++, VisualBasic, SQL*Server, JAVA, ODBC in Windows-95/NT. Requirements: Master's degree in Electrcl Engnrng, or Math, or Cmptr Sc or related field plus a minimum of two yrs experience as Software Eng., or Programmer, or Systems Analyst, or Consultant or related occupation. Related occupational experience must include two yrs. exp. in the design, development, implementation and testing of software design & development projects using Visual C++, VisualBASIC, SQL*Server, JAVA, ODBC in Windows-95/NT. $65,000/yr, 8 am-5 pm, 40 hrs/wk, M-F. Applicants should respond to Case #60003, P.O. Box 8968, Boston, MA 02114 and should submit 2 copies of resume.

Programmer Analyst - Analyze business procedures & problems to refine data. Design, dvlpmt, implementation & maintenance of application software. Analyze, design & implementation of s/ware systems involving Sun Sparc, Dec Alpha, HP 9000, IBM PC, Power Builder, Sybase C/C++, Java, Oracle, S-designer Install Shield. MUST HAVE Bachelor's Comp Sci, Engineering or Electronics, 2 yrs exp. in job offered or 2 yrs exp. as Systems Analyst or Programmer Analyst. Must have working knowledge of client server environments, UNIX, computer architectures, d/base design, networking, case tools, Powerbuilder, Sybase, C/C++ & S-designer. 9-5, 40 hrs/wk, $60K. Job located in various sites thruout Florida. Send resume to the Dept of Labor/Workforce Program Support, PO Box 10999, Tallahassee, FL 32302, Attn: S. Clark, Re: JOFL#1837739.

Systems Analyst needed F/T for Manh Mfg & Importing Co. Must have 3 yr exp dsgng, applying & maintaining concepts of EDI using Unix & Novell & administering d/base & operating systm in SQL, Progress & C. BS in Comp Sci needed. Respond to: HR Dept., Pan Oceanic Eyewear, Inc., 5th Flr, 15 W 37th St., NY, NY 10018.

FAX

Campus Edition

Issue:
October 31, 1998

Space Deadline:
September 18, 1998

Material Close:
October 9, 1998

COMPUTER SYSTEMS ANALYST - (Jacksonville, FL). Design, dvlp and test int'l actuarial software products to run on Windows, Win 95 and NT, including project control facility, table functionality with spreadsheet, OCXs, import/export files, and converting 16-bit applications and libraries to 32-bit. As a member of OO (object oriented) design and standard team, involved in analysis, design, and standard setup for new component based (COM/Active X) OO sys. Programming in Visual C++ and use of MFC libraries. Req's: Bachelor's or equiv in Comp Info Sys & 1 yr exp in job offered or 1 yr exp as Consultant or Systems (Programmer) Analyst working with OO software dvlpmnt on Microsoft Windows, programming in Visual C++ and use of MFC libraries. 40hrs/wk; 9:00am-5:00pm; M-F; $47,500/yr. Send resume to Dept of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302, Attn: JOFL#1834463.

Database Administrators needed. Several Positions available. For senior level positions, candidates should possess MS and relevant experience. Work with GIS-Oracle database and CASE tools. Send resumes to HR, Software Solutions Group, Inc., 3300 Buckeye Road, Suite 555, Atlanta, GA 30341.

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SOFTWARE ENGINEER. Research, design and develop Industrial, Manufacturing and Business Software Systems and Applications including On-Site User Research, Identification, Analysis, Design and implementation of specialized software applications systems using: C, C++, Visual C++, COM, C Toc, ODBC, VHD (VHR, SQL, Oracle and its related tools, and Internet in Windows, Unix and Linux platforms, migration, large, volume application systems on multi-hardware/software environments using migration & data conversion tools. Develop and direct software testing procedures, programming and documentation. Education & Experience: MS degree in Computer Science, Related Field with two (2) years experience in job offered. Salary: $65,000/yr. Benefits: major medical for self, employee, and sick leave. Applicants having proof of legal authority to work in U.S. respond to Ramesh Gosh, Vice President, Software Solutions Group 3300 Buckeye Rd, Suite 555, Atlanta, Georgia 30341 or call (770) 455-9991 or fax (770) 455-6463 or e-mail at sgi@mindspring.com. An Equal Opportunity Employer.

PROJECT MANAGERS experienced in preparing integrated project plans and dvlpng policies & procedures using d/ base dvlpmnt tools like Primavera P3 needed for NJ Consulting Co. Respond to: HR Dept., Global Consultants Inc., 601 Jefferson Rd., Parsippany, NJ 07054.

Computer Consultant needed by Computer software & hardware retailer to Valley Stream, NY. Must have 2 yrs exp dvlpg, planning, & supv'g consultation & implmtn of computing systms for corporate & business envrnmts. Bachelors in Commerce, Bus. Admin or Comp Sci reqd. Respond to: HR Dept., Software Connection (USA) Inc., 145 Hookcreek Blvd., Valley Stream, NY 11581.

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Develop software applications, testing tools, and software development tools for PTC's Pro/ENGINEER product suite. BSCS, BS in Math or BSME and 1-4 years' experience. UNIX, Windows NT, C, C++, Perl, Java, Shell Scripting

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Provide Pro/E hot line support PTC's Pro/ENGINEER product suite. BSME, MSME, 1-4 years' experience, familiarity with CAD systems.

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Provide technical and pre-sales support to field sales organization for product data management application (PDM). BSCS and 1-4 years' experience. UNIX, Windows NT, C, C++.

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Perform technical and consulting activities including system design and implementation. BS or MS in an engineering discipline and 1-4 years' experience with PDM products required.

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Translate Pro/E products and localize Pro/E for distribution in European, Asian and Pacific Rim markets. Requires a BS in Translation, native fluency in a European or Asian language, 1-4 years' experience.

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Requires experience porting commercial software for the European, Asian and Pacific Rim markets. BSCS, 1-4 years' experience, UNIX, Windows NT, C, C++.

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DATABASE ADMINISTRATOR 2

The New Mexico General Services Department is currently accepting applications for three (3) permanent, full time Database Administrator 2 positions in Santa Fe, New Mexico. These positions are responsible for DB2 data base analysis, design, & support for applications systems & programs on an OS/390 host environment.

QUALIFICATIONS: BS in Computer Science, Mathematics, Physics or Engineering plus an equivalent university level course of study or advanced (4 years) of experience in these fields. Will ask for data requirement. Exp. in a Systems Analyst in a multi-user environment, applications programming, or systems analysis & design totaling 5 yrs, 1 yr of which must have been in DB2 design. Extensive exp using MVS/JCL, SQL, & IBM & DB2 utilities. Salary: $19.10 - $28.87/hourly

For further information call (505) 827-2035 or (505) 827-2067. Or call, Personnel Office. Application form SPD-300 & job announcement may be obtained at it must be returned to the State Personnel Office, 2040 Cerrillos Road, P.O. Box 26127, Santa Fe, New Mexico 87502-6127 by the close of business on December 4, 1998. The State of New Mexico is an Equal Opportunity Employer.

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Analyst - Corporate R&D (3 openings) 40 hrs/wk, 8:00am-4:30pm, $47,900 - $62,400/yr. Responsible for utilizing UNIX, DOS, C, C++ & FORTRAN to develop & implement decision support systems related to airline operations (fleet planning, aircraft & crew scheduling, demand forecasting, operations control &/or yield mgmt.), designing & developing software to analyze, identify & implement productivity improvements; analyzing user requirements, procedures & problems to improve existing computer systems; conferring with other operations research personnel to analyze current operational procedures, identifying problems & developing specific input/output requirements. Database design & integration. Additional tools: IBM MVS. Master's degree in Operations Research or Systems Eng. + 6 mos exp in job offered or as Grad Research Asst. or Research Assoc. required. Will also accept candidates w/M.S. in comp. or info. sci., or industrial eng., or relevant eng. discipline (including civil, transportation or electrical eng.). Academic program or exp. must have included development of decision support systems utilizing programming in UNIX, DOS, or IBM MVS, C/C++ or FORTRAN. Academic programs or exp. must also have included use of database design or integration. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Joan Sybalus, Reference #N-R-19058-S. NO CALLS. An Employer Paid Ad.

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- Y2K Analysts
- AS400 RPG/Cobol Programmer Analysts
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- PC/MAC Phone Support
- Network Engineers (Telecommunications)

SOFTWARE ENGINEERING
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- GUI Developer VC++, Java, HTML, Win32
- Oracle DBA Developer
- C++, Corba, Java
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Database Administrator. Support client/server application development projects including conceptual and physical design, prototyping and development, data modeling and support and performance tuning on various Object-based platforms. Will write database scripts for creating tables, views and stored procedures. Triggers and rules. Act as database architect and integrate the database with other application modules. Be involved in all aspects of development of client/server business applications including initial identification, design, development, and implementation. Will implement systems in multi-platform environments using combination of centralized and distributed database systems. Physical design of database(s) in mainframe environment. Tools: PL/SQL, SQL*Loader, SQL*Plus, Unix shell programming. B.S. in Computer Science plus 1 yrs exp or job offered or as Database Designer and Developer required. Previous exp or education must include developing systems in a multi-platform, multi-software environment using centralized and distributed database systems (ORACLE, Data Warehousing, Oracle Utils, PL/SQL, SQL, SQL*Loader, Pro*C, Unix shell programming and C, 40 hrs/wk, $60,000/yr. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Janet Aschenbrenner, Reference #V-IL-17571-A. NO CALLS. An Employer Paid Ad.

Systems Analyst to analyze user procedures, and requirements to improve computer systems and software. Confer with user personnel to define or analyze current operational procedures, identify problems, and form specific, input/output requirements. Write detailed description of user needs, program functions, and steps required to develop or modify computer programs. Review computer system capabilities to determine if requested program or program change is possible within existing system, considering effectiveness of machine processing, cost, and future development needs. Direct or assist in systems development activities. Write block diagrams and detailed flowcharts of the program's development. Translate systems and program specifications to coded instructions. Bachelor or equivalent in Computer Sc. plus 1 yr exp in job offered req. Salary: $54,000/yr. Job site: various unanticipated sites throughout the U.S. Employer location: Pittsburgh. Send resume to Job #0339507, James Madden, Pittsburgh South Job Center, 1122 Freeport Avenue, Pittsburgh, PA 15238.

Programmer - Assist in developing 16-bit and 32-bit Windows applications with Object Design & Analysis using C & Visual C++, Req. Bachelor's degree or equivalent in computer science or related field plus 2 yrs exp. Sal. mid 50's to upper 60's. Fax resume to A. Jenkins at (770) 642-7976 or email at sparkline@mindspring.com. No phone calls please. Principals only. Dietz, Inc. is an Equal Opportunity Employer M/F/V/H.

Senior Programmer Analyst, South Portland ME. Research, design & code software systems & programs for high tech medical, industrial, scientific, financial & business applications. Lead teams of programmers & systems analysts in design & direct systems testing procedures, programming & documentation. Req'd Master's in Comp Sci or bdo Sci. 1 yr exp or 1Yr as Programmer Analyst. Exp must have included exposure to multi-job stream & networked environments. UNIX, Windows NT, DOS, C, C++, 40 hrs/wk, 9-5 $55K/yr. Send resume or letter to Bureau of Employment Services 55 State House Station, Augusta, ME 04333-0055. Refer to Job #0338227

Programmer Analysts to plan, develop, test and document computer programs, applying knowledge of programming techniques and computer systems. Evaluate user requests for new or modified programs to determine feasibility and cost and time required, compatibility with current systems and computer capabilities. Formulate ideas outlining steps required to develop program, convert project specs into sequence of instructions and logical steps for coding with language acceptable to computer applying knowledge of computer programming techniques and terminology. Analyze, review and rewrite programs to increase operating efficiency or adapt to new requirements. Install and test programs at user site and consult with user personnel on site problems. In Computer Sc or Elec Engineering plus 2 yr exp. in job offered or 2 yr as programmer analyst or software engineer req. Salary: $55,230/yr. Job site: various unanticipated sites throughout the U.S. Employer location: Pittsburgh. Send this ad and resume to Job #7039507, Pittsburgh South Job Center, 2100 Wharton Street, Pittsburgh, PA 15203.

Software Engineer. We use various software engineering techniques to design, develop, maintain, and modify software products for retail banking systems, for software installation in a Tandem based hardware system. Will resolve advanced software integration and implementation problems for purposes of insuring that products meet various and users requirements and technical specifications. Develop and operate conversion and migration systems and insure that software is capable of performing in various telecommunication ports by developing appropriate software engineering functions. Under direction of main office, will travel to various customer site locations within the United States. Required Bachelor's Degree in Computer Science and two years of experience in the job offered. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $43,000.00 per year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Chittenden, Nebraska Department Labor, PO Box 94600, Lincoln, Nebraska 68509. Refer to Job Order NE0222551. This advertisement is paid for by the employer.

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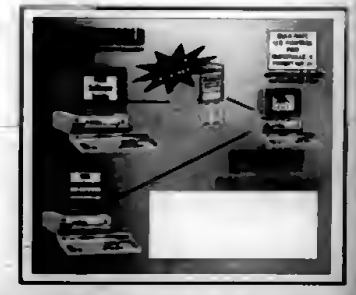

- October Marketpack focus on networking products.
- Bonus distribution at Networld + Interop, Oct. 21-23, Atlanta, GA.
- Advertising close - Sept. 11, 1998.

* IDG Research Services, CW Marketpack Study, May 1998.

The Week in Stocks

Gainers

PERCENT

Radiant Systems Inc	33.6
Adaptec Inc.	20.3
Bay Networks Inc.	18.3
Netscape Comm. Corp.	15.6
Seagate Technology	13.2
Xerox Inc.	12.1
J.D. Edwards Co.	11.9
Rollins Inc.	11.5

DOLLAR

Amazon.com	10.19
Rambus Inc	6.63
J.D. Edwards Co.	4.50
Netscape Comm. Corp.	3.94
Apple Computer Inc.	3.56
Bay Networks Inc.	3.50
Seagate Technology	3.19
Compuware Corp.	2.88

Losers

PERCENT

Cognitronics Corp.	-40.0
Open Market Inc.	-22.6
Visioneer Inc.	-20.0
Storage Computer Corp. (L)	-18.8
Walker Interactive Systems (L)	-17.2
Platinum Technology	-14.5
Cisco Corp.	-14.4
Sybase Inc.	-14.3

DOLLAR

IBM	-4.38
Lotus Dev.	-4.00
Platinum Technology	-3.88
Computer Associates	-3.00
First Data Co.	-2.88
Peoplesoft	-2.50
Intuit Inc.	-2.25
America On-Line	-2.13

INDUSTRY ALMANAC

Lucent grows up, way up

AT&T Corp. (NYSE:T) spun off its equipment division as Lucent Technologies (NYSE:LU) in 1996 as a way to strengthen both companies. That way, Lucent could sell to all carriers, including AT&T, and competing carriers wouldn't have to worry about having AT&T as an equipment supplier.

The benefits of the spin-off haven't been huge for AT&T's stock. But for Murray Hill, N.J.-based Lucent, it's hard to argue with the results. In just over two years, the stock shot up sevenfold, topping out at 108-1/2 last month. With the market's recent downturn, Lucent's stock has retreated to the high 80s. In April 1996, the stock traded near $15.

So was spinning off such a valuable asset a mistake for AT&T? Hardly, says Bruce S. Carlsmith, a senior research analyst at Nationsbanc Montgomery Securities in San Francisco. Lucent's strong performance "could not have happened if [AT&T] had kept it," said Carlsmith, who called the spin-off "a classic good idea for shareholder value."

During its short history, Lucent has gone on a shopping spree. Acquisitions have included Asynchronous Transfer Mode equipment maker Yurie Systems, Inc.; Gigabit Ethernet switch maker Prominet Corp.; remote access vendor Livingston Enterprises, Inc.; and voice messaging vendor Octel Communications Corp.

The purchases have moved Lucent closer to competing head-to-head against Cisco Systems, Inc. (Nasdaq:CSCO) in networking equipment. But, according to Carlsmith, although Lucent has made steps toward being competitive, it still "is not there yet."

That hasn't stopped the two companies from squabbling. In June, Lucent sued Cisco, charging it with violating eight data networking patents [CW, June 24]. Last week, Cisco hit back with a countersuit. — Jeremy Schrym

DOING FINE ON ITS OWN

Lucent's stock has outperformed former parent AT&T since being spun off in 1996

Exch	52 Week Hi	52 Week Lo	Stock	Aug. 14 '98 Net Close	Wk Net Change	Wk Pct Change
COMS	50.75	22.50	3 COM Corp	28.81	1.88	3.5
AIT	52.13	30.13	AMERITECH Corp	47.25	1.00	2.2
ASND	55.00	22.00	Ascend Communications	44.38	1.00	3.9
T	68.50	38.50	AT & T	55.00	2.50	4.8
BNTN	11.38	1.75	Bantam Systems Inc	5.75	0.84	12.8
BAY	41.88	21.63	Bay Networks Inc	38.50	1.81	5.6
BEL	61.00	36.00	Bell Atlantic Corp	41.56	-0.56	3.3
BLS	75.63	43.31	Bellsouth Corp	67.75	2.25	3.5
BRKT	23.75	9.50	Brocade Communications	16.18	1.56	7.7
CS	36.25	9.94	Castelle Systems (L)	9.94	1.00	-9.9
CGRM	21.88	8.56	Certicom Communications	11.11	0.19	1.7
CSCO	104.56	45.00	Cisco Systems Inc	88.00	1.19	1.2
CMNT	6.50	3.50	Computer Network Tech	5.61	0.11	2.3
CNCX	41.00	7.88	Concentric Network Corp	22.38	2.00	8.3
DIGI	35.69	16.50	DSC Communications	29.25	2.19	7.0
FORE	28.00	13.25	FORE Systems Inc	23.50	0.94	3.8
GDC	7.56	3.25	General Datacomm Indu	3.56	-0.56	-9.5
GSIC	44.00	35.50	General Signal Networks	36.00	-0.50	1.3
GTE	64.56	40.50	GTE Corp	44.19	1.13	2.2
LU	108.50	56.19	Lucent Tech	86.00	8.00	6.5
MADGF	9.19	3.25	Madge Networks NV	3.25	0.00	13.9
MCIC	70.68	27.81	MCI Communications Corp	61.44	1.00	2.7
NETM	5.25	1.66	Netmanage Inc	1.81	0.22	10.6
NTRK	3.50	0.63	Netrix Corp	1.44	1.13	43.9
NCDI	13.75	5.00	Network Computing Devices	6.94	-0.63	-8.1
NWK	33.00	13.67	Network Equipment Tech	14.38	2.38	2.5
NN	94.88	16.63	Newbridge Networks Corp	22.63	3.50	18.3
NT	69.25	30.00	Northern Telecom Ltd.	51.50	3.19	6.8
NOVL	13.63	6.81	Novell Inc	11.00	0.13	1.1
ODSI	14.50	5.19	Optical Data Systems Inc	6.11	0.63	11.4
PCTL	13.50	5.63	Picturetel Corp	8.56	-0.44	-5.0
OPEN	1.00	0.07	Proxicom Inc	1.19	0.00	5.0
RACO	4.13	1.00	Racotek Inc	2.31	-0.31	11.9
RADS	29.50	9.00	Radiant Systems Inc	8.88	1.03	23.6
RBTL	11.63	1.00	Retix	2.88	0.13	5.0
SBC	94.56	69.75	SBC Communications	80.00	-0.19	-0.6
SFA	27.50	14.00	Scientific Atlanta Inc	24.19	0.88	3.6
SMAL	16.44	5.00	Smaln Corp	6.00	0.13	15.8
FON	75.63	45.25	Sprint Corp	70.75	2.00	2.9
QWST	47.50	16.19	QWest Communications	40.44	0.69	1.8
SMSC	10.13	7.88	Standard Microsystems Corp	8.25	-0.13	1.5
USW	88.00	0.29	U S West Inc	51.13	0.44	0.9
3IRC	24.88	8.63	3Recom (M)	24.88	2.00	8.7
XYLN	11.31	1.78	Xylan Corp	25.31	2.00	7.9

AAPL	41.00	12.75	Apple Computer Inc (H)	30.94	3.56	9.6
CPQ	50.75	25.13	Compaq Computer Corp	39.63	0.00	0.2
DELL	106.25	35.00	Dell Computer Corp	100.31	4.75	1.8
GTW	60.75	29.00	Gateway 2000 Inc	38.00	1.50	2.7
HWP	67.88	49.00	Hewlett Packard Co (L)	52.63	0.00	0.0
MLHY	30.75	6.44	Micron International Inc	14.88	0.00	0.0
NIPNY	94.56	38.88	NEC America (L)	88.00	3.56	3.6
SGI	40.11	10.00	Silicon Graphics	10.56	-0.44	4.0
SUNW	53.31	40.50	Sun Microsystems Inc	94.88	2.25	4.3

DGN	17.50	11.00	Data General Corp	11.31	1.25	10.0
IBM	130.13	68.63	IBM	124.75	-6.13	4.7
MDCD	6.63	3.88	Meridian Data Inc	5.00	0.50	10.0
NCR	38.50	23.69	NCR Corp	30.88	1.94	6.9
PRCM	20.63	4.00	ProCom Technology Inc	5.00	0.00	0.0
SQNT	21.25	9.38	Sequent Computer Sys	20.13	1.31	11.5
TEXM	6.00	2.75	Texas Micro Inc	3.00	0.00	0.0
SPA	60.75	21.44	Stratus Computer Inc	33.75	1.50	4.3
UNS	30.00	20.19	Unisys Corp	28.56	0.38	1.7

ADBE	53.11	24.56	Adobe Systems Inc (L)	28.94	3.88	31.6
AMSWA	15.63	3.38	American Software Inc (L)	4.19	0.31	8.1
APLX	12.88	2.63	Applix Inc (L)	2.81	-0.88	11.8
APSW	53.25	30.13	Aspen Software	33.44	2.44	7.9
ARDT	15.00	0.66	Ardent Software	13.25	-0.13	-0.9
APSC	36.00	29.25	Aps Corp	30.00	1.00	3.7
ADSX	59.13	30.44	Autodesk Inc	52.56	1.56	4.6
BMCS	28.50	27.50	BMC Software Inc	34.75	-0.50	1.0
BOOL	26.00	14.69	Boole and Babbage	20.38	0.50	4.7
BOBY	20.00	6.66	Business Objects	13.88	-0.44	3.1
CAYN	3.50	0.53	Cayenne Software Inc	0.88	0.05	5.0
CNTR	3.33	0.88	Centura Software	1.09	0.18	10.2
CHKPF	60.00	21.88	Checkpoint Software	24.34	1.66	7.3
COGNF	34.75	17.66	Cognos Inc	21.94	1.44	6.1
CA	61.38	30.63	Computer Associates	36.00	1.69	4.9
CPWR	60.31	36.75	Compuware Corp	37.00	2.00	5.7
CSRE	9.81	3.97	Courtaulx Inc	4.56	-0.19	10.8
COSFF	6.50	1.38	Cosmi Corp (L)	1.00	0.00	0.0
DWTI	5.50	2.13	Datawatch Technologies Inc	3.25	0.00	1.9
DCTM	59.63	26.00	Documentum, Inc	44.13	1.18	3.2
FILE	32.00	7.56	Filenet Corp	22.19	-2.00	8.3
FSFT	16.56	3.00	Fourth Software	4.00	0.25	5.1
FTPS	4.63	1.00	FTP Software Inc	1.19	0.00	7.3
GPSI	44.00	20.38	Great Plains Software, Inc	38.13	1.75	4.8
HUMCF	54.25	19.88	Humanidoodi Comm. Ltd.	19.88	1.31	6.3
HYSW	80.63	23.50	Hyperion Software Corp	31.00	1.00	3.1
IBIC	50.00	12.50	Information Resources	13.25	1.31	9.0
IFMR	20.75	4.00	Informix Corp	5.47	-0.63	10.3
INPR	12.19	5.63	Inprise Corp	8.56	0.06	1.0
INGR	14.19	8.40	Intergraph Corp	6.38	-0.88	8.9
LEAF	4.00	1.22	Interleaf Inc	1.44	-0.25	14.8
ISLI	29.25	11.25	Interwin Inc	17.25	-0.13	0.7
INTU	67.94	23.63	Intuit Inc.	30.88	-4.25	0.5
JDEC	86.25	28.88	J.D. Edwards Co	42.25	4.88	11.6
TLC	25.81	10.38	Lawson Co. (The)	20.88	1.00	5.6
MANU	40.88	18.19	Manugistics Group, Inc	22.63	2.38	6.7
MAPS	14.31	2.38	Mapinfo Corp	12.50	-0.25	2.0
MATH	4.63	2.38	MathSoft	2.63	-0.50	12.3
MENT	13.13	8.11	Mentor Graphics	9.00	-0.06	-0.6
MFGY	40.00	30.25	Micro Focus	30.50	2.25	5.8
MCKI	14.88	6.88	Microcraft Inc	13.25	1.25	10.4
MSFT	119.63	50.00	Microsoft Corp	108.56	-1.75	1.9
OBJS	5.25	0.44	ObjectShare, Inc.	2.00	-0.13	-6.8
ONYL	75.00	3.81	Onyx Soft	4.38	-0.19	-4.1
ORCL	68.13	57.75	Oracle Corp	29.75	1.44	5.1
PMTC	36.31	31.50	Parametric Technology	34.00	-0.09	-0.7
PSFT	57.44	26.00	Peoplesoft	36.00	-4.50	11.8
PTEC	38.50	8.88	Phoenix Technologies	10.88	-0.50	-4.4
PSQL	27.25	7.63	Platinum Software	19.88	-0.63	3.2
PLAT	50.81	17.88	Platinum Technology	25.81	-3.13	10.8
PRGS	80.13	11.88	Progress Software Corp	30.66	1.88	6.5
RNBO	80.13	11.88	Rainbow Technologies Inc	14.56	0.13	-0.9
REDB	11.66	1.88	Red Brick Systems Inc	2.38	-0.13	5.0
ROSS	5.88	2.00	Ross Systems, Inc	4.25	0.19	4.6
SCDC	7.25	2.63	SCO Inc	3.38	-0.06	-1.8
SDTI	43.75	30.63	Security Dynamics Tech.	32.63	0.50	1.1
SSW	32.81	19.88	Sterling Software Inc	21.38	-1.63	6.0

SORC	30.00	12.56	Stacey Dynamics Research	12.75	1.19	8.5
SYBS	23.63	6.13	Sybase Inc	8.97	0.16	1.8
SYMC	32.63	17.88	Symantec Corp	24.94	1.00	4.2
SNPS	47.13	29.13	SynOpsys	36.19	-0.38	2.5
SSAX	17.63	4.00	System Software Assoc	5.88	-0.06	-0.6
SYSF	13.88	1.08	Systemsoft Corp	1.31	-0.13	8.7
BAANF	55.88	38.56	The Baan Co	35.63	-4.69	11.6
TRUV	5.19	0.75	Television Corp	1.88	0.00	0.0
VIAS	80.25	9.88	Viasoft Inc (L)	10.56	1.09	11.6
VSIO	56.88	40.50	Visio Corp	56.00	2.50	4.5
WALK	80.44	7.75	Walker Interactive Systems (L)	8.13	1.69	17.2
WALL	21.88	10.13	Wall Data Inc	11.00	-0.69	5.1
WANG	52.25	19.13	Wang Laboratories Inc	24.44	2.06	9.2

AMZN	147.00	11.66	Amazon.com	124.56	80.19	8.9
AOL	140.50	31.66	America On Line	105.31	3.75	3.4
ATHM	57.25	18.00	At Home Corp	39.56	-0.19	0.4
EDFY	22.13	5.88	Edify Corp (L)	6.25	-0.13	2.0
XCYT	55.00	7.13	Excite Inc	41.94	2.50	6.0
SPEE	45.00	4.50	Infoseek Corp	24.50	1.19	4.7
LCOS	107.25	16.25	Lycos Inc	61.56	1.44	2.3
NSCP	44.63	14.88	Netscape Comm Corp	29.13	3.94	13.6
NSOL	58.00	11.75	Network Solution Inc	20.50	-2.10	4.3
OMKT	29.13	8.88	Open Market Inc	12.56	3.56	22.4
PEGS	31.00	12.00	Pegasus Systems	17.31	0.41	4.9
PSIX	21.88	4.25	PSINet	15.25	1.88	11.5
QDEX	3.40	0.88	Quarterdeck Corp	0.53	0.00	0.0
SCUR	16.25	5.56	Secure Computing Corp	11.00	-0.38	3.0
SPYG	18.50	4.00	Spyglass Inc	10.13	-0.50	-4.7
YHOO	103.75	16.13	Yahoo! Inc	91.94	2.44	2.7

AMD	42.75	16.19	Advanced Micro Devices	18.13	0.00	0.3
ADI	39.63	20.75	Analog Devices Inc	22.44	0.00	0.3
CRUS	17.75	6.29	Cirrus Logic	9.00	-0.00	-5.3
CY	18.00	7.00	Cypress Semiconductor Corp	8.13	-0.13	-1.8
INTC	100.75	60.66	Intel Corp	80.13	1.13	1.3
LSCC	74.50	25.63	Lattice Semiconductor	30.75	-2.13	-6.5
LSI	25.19	10.31	LSI Logic Corp	18.38	1.19	5.9
MCRL	44.00	21.50	Micrel Semiconductor Inc	36.13	0.29	0.1
MU	44.13	20.00	Micron Technology	23.25	-0.81	-2.4
MOT	82.50	48.56	Motorola Inc	50.38	-2.88	-5.4
NSM	42.88	11.56	National Semiconductor	18.13	-0.94	-4.9
RMBS	80.00	35.00	Rambus Inc	61.38	6.63	12.1
TXN	71.25	59.63	Texas Instruments	59.75	-2.63	-4.2
VLSI	56.00	12.25	VLSI Technology	13.13	1.66	11.5
XLNX	55.63	28.50	Xilinx	41.38	1.88	4.3

ADPT	54.25	10.00	Adaptec Inc	14.00	2.38	20.5
APCC	34.38	22.13	American Power Conversion	32.75	-0.13	-0.4
ANEW	2.81	0.00	Answorld Inc	1.00	0.13	11.1
CREAF	29.38	9.38	Creative Technology Ltd. (L)	9.61	-0.81	7.6
RACE	9.88	5.00	Data Race Inc	2.13	0.13	5.6
DTM	13.00	7.88	Datatram Corp	13.00	0.00	0.0
EMC	38.38	23.88	EMC Corp (M)	32.31	0.25	0.6
EMUL	19.75	5.31	Emulex Corp	10.13	-0.25	-2.4
ESCC	31.94	21.94	Evans and Sutherland	24.00	-0.88	3.5
EXBT	13.75	5.63	Exabyte	6.25	-0.13	2.0
ISFD	4.56	0.00	Intelligent Info. Systems (L)	0.91	-0.00	9.4
IOM	16.75	4.47	Iomega Corp (L)	3.00	-0.19	5.6
KMAG	23.25	3.63	Komag Inc	3.44	-0.75	-13.9
MTSI	34.88	13.00	Micro Touch Systems Inc	11.88	1.13	7.5
MTEC	17.88	6.50	MTI Technology Corp (L)	6.88	-0.00	-3.5
AQM	23.06	5.25	QMS Inc	1.88	-0.25	-6.1
QNTM	43.25	14.81	Quantum Corp	16.38	1.38	7.8
RDUS	7.50	1.44	Radius Inc	1.81	0.19	11.5
SEG	30.38	17.75	Seagate Technology	27.25	3.19	13.2
SOS	14.00	2.88	Storage Computer Corp (L)	2.88	-0.63	11.9
STK	31.13	23.31	Storage Technology	37.88	-0.06	0.2
TEK	48.19	26.44	Tektronix Inc	39.09	0.19	0.6
WDC	54.75	18.25	Western Digital Corp	15.13	0.81	5.6
XIRC	116.00	60.19	Xircom Corp	100.00	2.81	2.7

AMSY	31.50	17.63	American Mgmt Systems (H)	33.00	1.25	3.5
ANLY	28.50	20.19	Analysts Int (L)	29.63	0.19	0.8
AUD	75.50	26.56	Auto Data Processing	67.75	2.31	3.5
CATP	36.38	31.00	Cambridge Tech. Partners	45.00	-0.50	-1.1
CEN	64.50	32.13	Cendant Corp	56.25	1.50	2.7
CDO	29.25	12.88	Computer Horizons	14.06	-0.50	-3.4
CPU	14.00	14.00	CompUSA Inc.	12.38	-0.75	-4.1
CMRZ	53.50	25.75	Computer Horizons	25.29	-0.29	-0.6
CSC	68.88	33.63	Computer Sciences	57.25	-1.06	-0.0
FSH	80.56	23.00	Computer Task Group	29.50	1.29	6.5
CCGS	29.13	5.00	Eggcard Discount Software	12.50	1.19	8.7
EDS	56.88	29.56	Electronic Data Systems Corp	50.31	0.00	0.0
ICO	39.63	22.63	Inacom Corp	28.81	1.69	5.9
KEA	80.94	54.00	Keane Inc	53.13	1.00	2.9
MICA	29.75	10.00	Microdyne Inc	15.19	-0.00	-2.4
PAYX	45.00	21.88	Paychex	40.75	-0.25	-0.6
PMTS	47.81	27.56	Policy Management Sys. (H)	34.94	0.69	1.5
REY	54.00	15.13	Reynolds and Reynolds (L)	15.13	1.88	8.5
SAFE	62.00	33.88	Safeguard Corp	44.63	3.94	7.2
SCBI	14.75	6.50	SCB Computer Tech. Inc	8.88	-0.25	-2.7
SEIC	78.88	28.00	SEI Corp	74.00	0.25	0.3
SMS	80.56	47.63	Shared Medical Systems	63.38	1.25	2.0
SSPE	24.25	20.75	Software Spectrum Inc	20.56	-1.38	-6.4
SDS	41.00	22.44	Sungard Data Systems	36.13	0.31	0.9
SYNT	29.88	6.69	Syntel, Inc	21.56	1.38	6.5
VST	17.25	7.88	VanSant Corp (L)	7.66	0.88	10.6

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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BP, Amoco merger

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The aggressive London-based British Petroleum, by contrast, has been on an outsourcing binge since the early 1990s, cutting $25n million from its information technology costs by divesting itself of dozens of data centers and thousands of global IT staffers. Last year, Chief Information Officer John Cross said the $71 billion company's IT head count stood at 97 people worldwide.

Even more IT staff cuts likely are on the way under the megamerger, which aims to save $2 billion annually by 2001, primarily by eliminating 6,n00 jobs companywide.

"There's certainly a fear that IT jobs will be outsourced. People in IT are the most concerned," said an Amoco IT manager who requested anonymity.

"Senior management has come to various sites and talked about the merger. The general comment was that IT was one of the areas that would be looked at very intensely in terms of overlap," he added.

On the technology front, experts said the two companies' greatest challenge lies in integrating the monstrous amounts of seismic and other geophysical data that each collects at exploration and production sites worldwide.

There's no one industry standard for sharing seismic and oil well data, which in the oil business is equal to a treasure map.

For example, Amoco and BP may have explored some of the same areas, but like all oil companies, their data is "defined differently, stored differently and the formats are different," said Gary Hodge, an executive at the Petrotechnical Open Software Corp. (POSC), a nonprofit industry standards group in Houston.

DATA-SHARING

"Data disparity is not a very sexy subject, but it certainly robs people of sleep and draws them away from the work of analyzing data," Hodge said.

In the past few years, POSC's oil company members have stepped up their efforts to adopt data standards as the cost of remote and deep-water exploration and drilling has sky-rocketed. To reduce their risks, oil companies have teamed on ventures around the world, particularly in parts of the former Soviet Union. That has increased the need for easy data-sharing.

But officially, both Amoco and BP said that neither has closely considered the IT impact of their marriage, much less made any decisions about the technologies on which the combined companies will run.

"At this point, there's nobody who can talk sensibly in such detail," a BP spokesman said. "A lot of regulatory issues must be decided between now and December, and only then can we start to meld the two corporate cultures."

For BP, that melding will mean prying loose much of its new partner's conservatism to adopt BP's highly prized values of entrepreneurship and innovation, analysts said.

Between its aggressive outsourcing, successful cost cutting and joint ventures with other oil companies, including one with Mobil Corp. in Europe, BP "has put together a track record of being highly innovative and prepared to recreate itself to fit into a changing world," said Martin Tallett, president of Ensys Energy and Systems, Inc., a petroleum industry consultancy in Flemington, N.J. Tallett has worked at both BP and Amoco.

Amoco, by contrast, comes from a far more conservative tradition. When Tallett worked there in the 1970s, the company called for "sacking an employee if he came in with a beard," he said. □

PLC Chief Executive Sir John Browne, left, Amoco Chairman Larry Fuller, center, and BP Chairman Peter D. Sutherland announce their merger at the Artillery Company in London

Cheap Web billing is catching on

CONTINUED FROM PAGE 1

costs 75 cents to $1.75 to send out and receive paper payments, but electronic bills can cut that in half. The EDS program, IBilling, is aimed at business-to-business bills.

EDS will offer systems integration help to connect a company's billing back-office systems to a Web front end, as well as the Internet billing itself.

By the end of 2001, 12% of all "repetitive bills" from phone companies, utilities and the like will be sent electronically, according to a study from Killen & Associates in Palo Alto, Calif.

"It absolutely is a cost reduction for us," said Marlene Beeler, transaction marketing vice president at AT&T Corp. in Basking Ridge, N.J. AT&T began to offer Internet billing for consumers on its own site this March, and "tens of thousands" of customers already have signed up, she said.

AT&T will work with CheckFree Corp. in Norcross, Ga., to expand the program, allowing scheduled electronic debits or "click to pay" from consumers' bank accounts later this year. CheckFree processes more than 80 million conventional payments each year and offers Internet banking services for about 3n0 institutions.

Also in the works: Northern Trust Co. in Chicago is launching a pilot this fall with several major corporate customers for business-to-business Internet billing. The pilot includes PepsiCo, Inc., Kraft Foods, Inc. and Nabisco Holdings Corp.

The bank now processes payments for its customers by clearing checks and posting data to its clients' accounts receivables systems. "It's a good fee business," said electronic-commerce manager Brian Hinton. The bank doesn't want to be left out as Internet payments evolve, he added.

Microsoft Corp. also is moving to Internet billing, partnering with First Data Corp. in a venture called MSFDC, which signed up some major utilities and manufacturers for a test project this year.

"It's a faster, more accurate invoice we can get to our customers," said Diane Croessman, vice president of U.S. customer business operations at Rochester, N.Y.-based Xerox Corp. The company will take part in the MSFDC pilot later this year and expects a more aggressive, national rollout in January.

STEEP HILLS

In order to appeal to business customers, Internet billing data has to integrate into those customers' accounting systems, Croessman said. "This isn't going to happen overnight."

Converting an entire billing system internally — instead of outsourcing — can cost between $25n,000 and $75n,000, according to Gartner Group estimates.

Experts said consumers need incentives to use those systems. AT&T, for example, offers a 9-cent-per-minute domestic long-distance rate, instead of its usual 10-cent rate. In addition, Spieler warned companies not to give up control of critical billing data to a third-party outsourcer and "lose the ability to have a relationship with their customers.

"It's a very good thing from a corporate perspective — if you play it right," she said. □

Tips for companies considering Internet billing and payment

- With competition among vendors heightening, try seeking price concessions or added services
- Conduct multiple pilot projects
- If outsourcing, don't give up control of customer billing data
- Give customers the ability to schedule payments, not just "click to pay"
- Offer incentives for customers to move to electronic billing

Source: Gartner Group, Inc., Stamford, Conn., and Current Analysis, Inc., Sterling, Va.

Browser standards targeted

A group calling itself The Web Standards Project debuted last week, with a charter to influence browser makers to do a better job supporting standards.

Some 450 Web developers signed on within the first few hours of the launch, according to founding member Glenn Davis, chief technology officer at Project Cool, Inc., a Web-based publisher in Palo Alto, Calif. The two major browser makers, Microsoft Corp. and Netscape Communications Corp., applauded the new group's efforts late last week but issued only "vague mutterings, nothing solid yet" in terms of meeting the group's demands, Davis said.

"The problem is, with each generation of the browser, the browser manufacturers diverge farther from standards support," Davis said.

One of the group's chief complaints is weak support for the Cascading Style Sheets 1 standard, which was designed to let Web developers attach colors and fonts to World Wide Web pages and space text more easily. Neither Netscape's nor Microsoft's 4.0 browsers fully support the standard, even though both shipped after the World Wide Web Consortium finalized the standard in December 1996.

Both Netscape group product manager Eric Byunn and Microsoft product manager David Wascha said Version 5 of their browsers will better support the standard. Internet Explorer is in beta now; Netscape's 5.0 browser is due by year's end.

The Web Standards Project also wants upcoming browsers to support Document Object Model 1 and XML 1.0.

— Carol Sliwa

Investor sites ride trade surge

▸ *Web stock traders prepared after 1997 crash*

By Sharon Machlis

WHEN THE stock market plunged more than 500 points last Oct. 27, a lot of online brokerage sites melted down along with the Dow Jones industrial average.

But the investment industry learned some lessons from that fiasco. During this month's skittish market — including one session that was the second-busiest trading day in New York Stock Exchange history — sites generally handled the increased traffic with aplomb.

"No one failed. They were all able to handle the load," said Alex Stein, a principal at Gomez Advisors, Inc., a consulting firm in Concord, Mass., that tracks the online financial markets.

But "probably 75% of the industry last October had periods of the day where customers just couldn't get in," he said.

Gomez Advisors was sharply critical of Internet investment sites last fall. But Stein said that this month, 14 of the top 20 brokerage sites had better site response time on the heavy trading days (Aug. 4 and 5) than they had averaged throughout the second quarter.

HOW TO KEEP 'EM COMING

Waterhouse Securities, Inc. in New York not only increased server capacity and improved its software, but also diversified its Internet service providers to create additional routes to its site, said senior vice president Paul Vienick. (Waterhouse had a 0.43-second response time Aug. 4 and 5, according to Gomez, the best of 20 sites monitored.)

Ensuring a robust Internet connection is one key to servicing customers, Stein said. Last October, several sites handled trades for all customers who logged on, but "their connections to the Internet weren't wide enough. . . . A lot of people couldn't get through the door," he said.

Brokers now typically plan systems to handle four times their average day's trading volume. Charles Schwab & Co. in San Francisco, for example, made five major upgrades to boost capacity since last October to meet that standard.

Investments in Internet infrastructure are paying off for brokers, who say their online customers make more stock trades and fewer calls to call centers.

The trading volume at Waterhouse, for example, is three times greater than in its pre-Internet days (January 1997), but the company increased staff by only 30%.

Despite the stock market's gyrations of late, Internet investors aren't turning to their phones for reassurance about their declining portfolio values.

"Our investors have been remarkably calm," said Denise Benou Stires, a spokeswoman for DLJ Direct, the online broker for Donaldson Lufkin & Jenrette, Inc. The company beefed up staff anticipating a flood of calls, she said, but "we have been able to handle that phone volume easily."

Online trading "has reduced the number of calls. It has created tremendous efficiencies," said Tom Taggart, a spokesman for Charles Schwab. That is good news for customers, who get quick access to more data than ever before, and for brokers, who don't have to field routine requests for information such as stock quotes.

"We learned a lot last October," Taggart said. "The Web has finally arrived as a mass-market tool." □

Charles Schwab's online trade statistics

	June 1996	Dec. 1997	June 1998
Active online accounts	617,000	1.2M	1.81M
Online customer assets	$42B	$80B	$128B
	Q1 1997	Q1 1998	Q2 1998
Online trades as % of total trades	36%	48%	52%
Average online trades per day	34,100	60,200	66,000

Source: Charles Schwab & Co., San Francisco

Health care CIOs endorse Y2K database

CONTINUED FROM PAGE 1

focus the efforts of year 2000 projects," said Joel Ackerman, former vice president of information systems at United Healthcare Corp. and now executive director of RX2000 Solutions Institute, a Minneapolis-based industry group.

The institute set out in 1996 to build such a system but found that health care companies didn't want to share information. "They didn't want to be sued, and they didn't want their customers to know they have uncovered year 2000 problems with their systems," Ackerman said.

Three weeks ago, a version of the RX2000 database that lets companies enter information anonymously into the database went live on the group's World Wide Web site (*www.rx2000.org*). However, it is available only to member companies.

VHA, Inc., an Irving, Texas-based network of more than 800 nonprofit hospitals, has a year 2000 products database, too, which is also available to members only. Though VHA's database was discussed at the conference, company officials declined to comment on plans to share the database with nonassociation members.

IS managers said it is time for groups to start sharing this information, regardless of their affiliation. Hospitals tend to have tight IT budgets and limited staffs. Plus, they must test and repair not only their computer systems, but also their biomedical devices — such as respirators and dialysis machines — that contain embedded chips. If these embedded chips hiccup, the result could be a harmful dose of radiation or medication.

HOSPITALS HURTING

The nation's hospitals aren't faring well with year 2000 work:

32% will complete year 2000 work before 1999

78% said they have begun their year 2000 work

30% have yet to plan a strategy to implement year 2000 updates

Base: 170 hospital executives in the U.S.

Source: Gordon & Glickson PC, Chicago

Without access to one of these databases, hospitals are essentially doing the same mundane work of contacting suppliers to determine if their equipment is year 2000-ready and testing the products, IS managers said. "We've done it by sending out letters to our suppliers, but they don't always respond," said Boyd McCleary, director of the year 2000 project at St. Francis Healthcare Services, which runs two hospitals in Honolulu.

St. Francis has 5,000 pieces of biomedical equipment. The Mayo Foundation in Rochester, Minn., has 30,000 and estimates that between 10% and 20% may not be year 2000-compliant, according to year 2000 manager Patrick Davitt.

In the absence of a centralized database, St. Francis developed a system for analyzing how much patient risk was involved with a device or application that might be affected by the millennium bug. "Our No. 1 priority was to reduce patient risk," McCleary said. Systems that ranked high on the risk scale — those that could result in death if they malfunctioned, such as life support equipment — were tested first.

That approach will help St. Francis complete its year 2000 work by the beginning of 1999, but other hospitals aren't so lucky. Stamford, Conn.-based Gartner Group, Inc. estimates that 80% of hospitals are still in the early stages of solving their year 2000 problem.

Stephanie Moore, an analyst at Giga Information Group in Norwalk, Conn., said awareness levels of the year 2000 problem are surprisingly low in the health care arena. "Part of the problem is that there is no [health care] regulatory agency requiring hospitals to deal with the issue," she said.

Larry Grandia, CIO at Intermountain Health Care in Salt Lake City, didn't attend the conference but said he strongly favors the building of a centralized year 2000-readiness repository. "We're all pretty much on our own," he said. □

MORE ONLINE

For resources related to health care and the year 2000, databases of medical device compliancy, articles and discussion, visit *Computerworld online.*

www.computerworld.com/more

FCC proposal has blurry future

By Matt Hamblen

THE FEDERAL COMMUNICATIONS COMMISSION recently proposed rules designed to bring high-speed data access to more homes and businesses, but it is far from clear if that will really happen.

The FCC proposal would require the five Baby Bells and GTE Corp. to set up subsidiaries to provide new data services, such as Digital Subscriber Lines for faster Internet access. The FCC said the Baby Bells wouldn't have to provide parts of those networks to competitors as required today.

Scott Matluck of the Communications Managers Association said, "I can't tell if it's in the best interest of [Baby Bells] or long-distance carriers." □

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Dispatches & images from the fringes of the electronic frontier

HE TAKES THE BLAME

His badge says, "My name is Y2K. You can blame all the screwups on me." Indeed, this cuddly-yet-tough simian can handle lots of criticism and ridicule. He sports a motion-activated sensor, so if you cross his path within eight feet he whistles and his eyes flash. The 12-in. cubicle-dweller costs $19.95 (batteries included). Y2K is from Dynawestern Sales Co. in Beaverton, Ore. Call (800) 365-9360.

News to pander

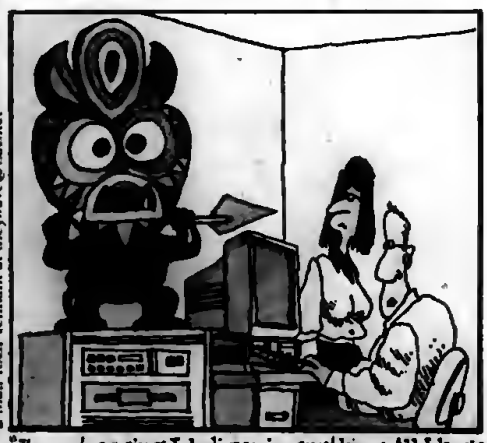
If you get a speeding ticket in certain parts of California, Texas or Florida, you can avoid an insurance rate hike by attending an online traffic school such as *www.onlinetrafficschool.com* or *www.webtrafficschool.com*. Pass one of these courses in driving safety, and the offense gets wiped off your record, *PC World* reports.

Mobile phone maker Nokia predicts that in the next 10 years, mobile phones will unlock and start cars, open front doors, program your VCR, switch on your television and program your coffee maker to brew up a fresh cup, according to Reuters.

Thieves in Britain are targeting millennium-compliant computer hardware, the BBC reports. "Obviously computers that have been updated are more marketable, and criminals are aware of that," says the chief inspector of Thames Valley Police.

THE FIFTH WAVE

BY RICH TENNANT



E-Mail Rich Tennant at thefwave@tiac.net

"I'm not saying I believe in anything. All I know is since it's been there, our server is running 50% faster."

Inside Lines

It's the thought that counts, right?

Computer Associates International recently warned one Midwestern manufacturing customer about a hefty 15% price hike that's about to arrive. Fortunately, CA is softening the blow — sort of. According to the software license renewal letter it sent the customer, CA said it hopes to "minimize" the effects of the price hike by reducing the increase from $11,300.85 to $11,686.05. For the calculationally impaired, that will save the customer a whopping ... $14.80.

Who's wired? Maybe not whom you think

They're looking for employees who "embrace technology" at Trinity Regional Health System, according to Will Walder, CIO at the hospital group in Rock Island, Ill. Trinity takes job applications over its World Wide Web site at a rate of a half-dozen per day. But potential hires who show up through the 'net aren't necessarily the high-end professional types you might expect. "We've had housekeepers apply over the Internet but a chief of nursing apply on paper," Walder said.

Well, they asked ...

Xerox webmaster Bill McLain takes customer service pretty seriously. McLain, who's in his 60s, makes sure his staff responds within 24 hours to every inquiry — whether it has to do with Xerox or not. He's answered questions about how many colors of M&Ms there are (26, most available only by special order), how dolphins sleep (the two halves of the dolphin brain sleep separately in eight-hour shifts) and whether there's any food colored the color of Welch's grape juice (only the Monbek, a South African antelope). One of his favorites: How long would it take to vacuum Ohio? McLain calculated how long it would take to vacuum a 10-foot-by-10-foot area and then scaled that up to the Buckeye State's dimensions. The answer is 33,661 years — not including Lake Erie.

Back to the future

Here's a Windows 98 bug only Dick Clark could love. If you boot up your PC using Windows 98 just as midnight strikes on New Year's Eve — this year or any year — you may find your computer's calendar about ahead by a few days. Despite some reports, the bug has nothing to do with the year 2000. A Microsoft spokesman confirmed the bug, which was discovered by Prove It 2000, a Cambridge, England-based year 2000 consultancy. Microsoft plans to post a fix for the bug, but users also can manually reset their calendars. You have to bring your own champagne.

Real words

If you still don't believe there's a year 2000 problem, now you can look it up. "Millennium bug" is one of 2,000 terms added to the brand-new edition of the New Oxford Dictionary of English, which hit British bookstores last Thursday. Also making the cut as actual words in the dictionary — which, at about $30, is a more-affordable edition from the chaps who also produce the gargantuan Oxford English Dictionary — are "infobahn," "spam" and "LOL," the E-mail abbreviation for laughing out loud.

The year 2000 problem is turning into the mile 20,000 problem for one Y2K project manager. The health maintenance organization he works for is on track with its plan to update its computer systems, so now it's on to the new phase: identifying which telephones, medical imaging systems and other electronic devices are date-sensitive. But workers in remote offices aren't coming up with those answers, so the hapless project manager will spend the next few months on the road — walking through each HMO office to see what equipment needs a millennium upgrade. On the road or at home, you can send news editor Patricia Keefe your news tips and tidbits. E-mail her at patricia_keefe@cw.com or call (508) 820-8183.

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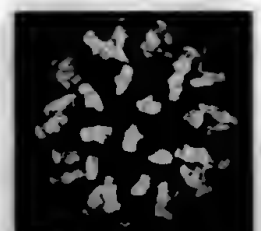
Mobile phone maker Nokia predicts that in the next 10 years, mobile phones will unlock and start cars, open front doors, program your VCR, switch on your television and program your coffee maker to brew up a fresh cup, according to Reuters.

Thieves in Britain are targeting millennium-compliant computer hardware, the BBC reports. "Obviously computers that have been updated are more marketable, and criminals are aware of that," says the chief inspector of Thames Valley Police.



You're looking at a computer model of the common cold virus developed by Purdue University scientists. It shows the 60 arms that adhere to receptors on human cells and eventually cause the sniffles. Rhinovirus 16 causes 70% of human colds.

THE FIFTH WAVE

BY RICH TENNANT

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"I'm not saying I believe in anything. All I know is since it's been there, our server is running 50% faster."

Inside Lines

It's the thought that counts, right?

Computer Associates International recently warned one Midwestern manufacturing customer about a hefty 15% price hike that's about to arrive. Fortunately, CA is softening the blow — sort of. According to the software license renewal letter it sent the customer, CA said it hopes to "minimize" the effects of the price hike by reducing the increase from $11,700.85 to $11,686.05. For the calculationally impaired, that will save the customer a whopping . . . $14.80.

Who's wired? Maybe not whom you think

They're looking for employees who "embrace technology" at Trinity Regional Health System, according to Will Weider, CIO at the hospital group in Rock Island, Ill. Trinity takes job applications over its World Wide Web site at a rate of a half-dozen per day. But potential hires who show up through the 'net aren't necessarily the high-end professional types you might expect. "We've had housekeepers apply over the Internet but a chief of nursing apply on paper," Weider said.

Well, they asked . . .

Xerox webmaster Bill McLain takes customer service pretty seriously. McLain, who's in his 60s, makes sure his staff responds within 24 hours to every inquiry — whether it has to do with Xerox or not. He's answered questions about how many colors of M&Ms there are (26, most available only by special order), how dolphins sleep (the two halves of the dolphin brain sleep separately in eight-hour shifts) and whether there's any land animal the color of Welch's grape juice (only the blesbok, a South African antelope). One of his favorites: How long would it take to vacuum Ohio? McLain calculated how long it would take to vacuum a 10-foot-by-10-foot area and then scaled that up to the Buckeye State's dimensions. The answer is 33,661 years — not including Lake Erie.

Back to the future

Here's a Windows 98 bug only Dick Clark could love. If you boot up your PC using Windows 98 just as midnight strikes on New Year's Eve — this year or any year — you may find your computer's calendar shoot ahead by a few days. Despite some reports, the bug has nothing to do with the year 2000. A Microsoft spokesman confirmed the bug, which was discovered by Prove It 2000, a Cambridge, England-based year 2000 consultancy. Microsoft plans to post a fix for the bug, but users also can manually reset their calendars. You have to bring your own champagne.

Real words

If you still don't believe there's a year 2000 problem, now you can look it up. "Millennium bug" is one of 2,000 terms added to the brand-new edition of the New Oxford Dictionary of English, which hit British bookstores last Thursday. Also making the cut as actual words in the dictionary — which, at about $50, is a more-affordable edition from the chaps who also produce the gargantuan Oxford English Dictionary — are "infobahn," "spam" and "LOL," the E-mail abbreviation for laughing out loud.

The year 2000 problem is turning into the mile 20,000 problem for one Y2K project manager. The health maintenance organization he works for is on track with its plan to update its computer systems, so now it's on to the new phase: identifying which telephones, medical imaging systems and other electronic devices are date-sensitive. But workers in remote offices aren't coming up with those answers, so the hapless project manager will spend the next few months on the road — walking through each HMO office to see what equipment needs a millennium upgrade. On the road or at home, you can send news-editor Patricia Keefe your news tips and tidbits. E-mail her at patricia_keefe@cw.com or call (508) 820-8183.

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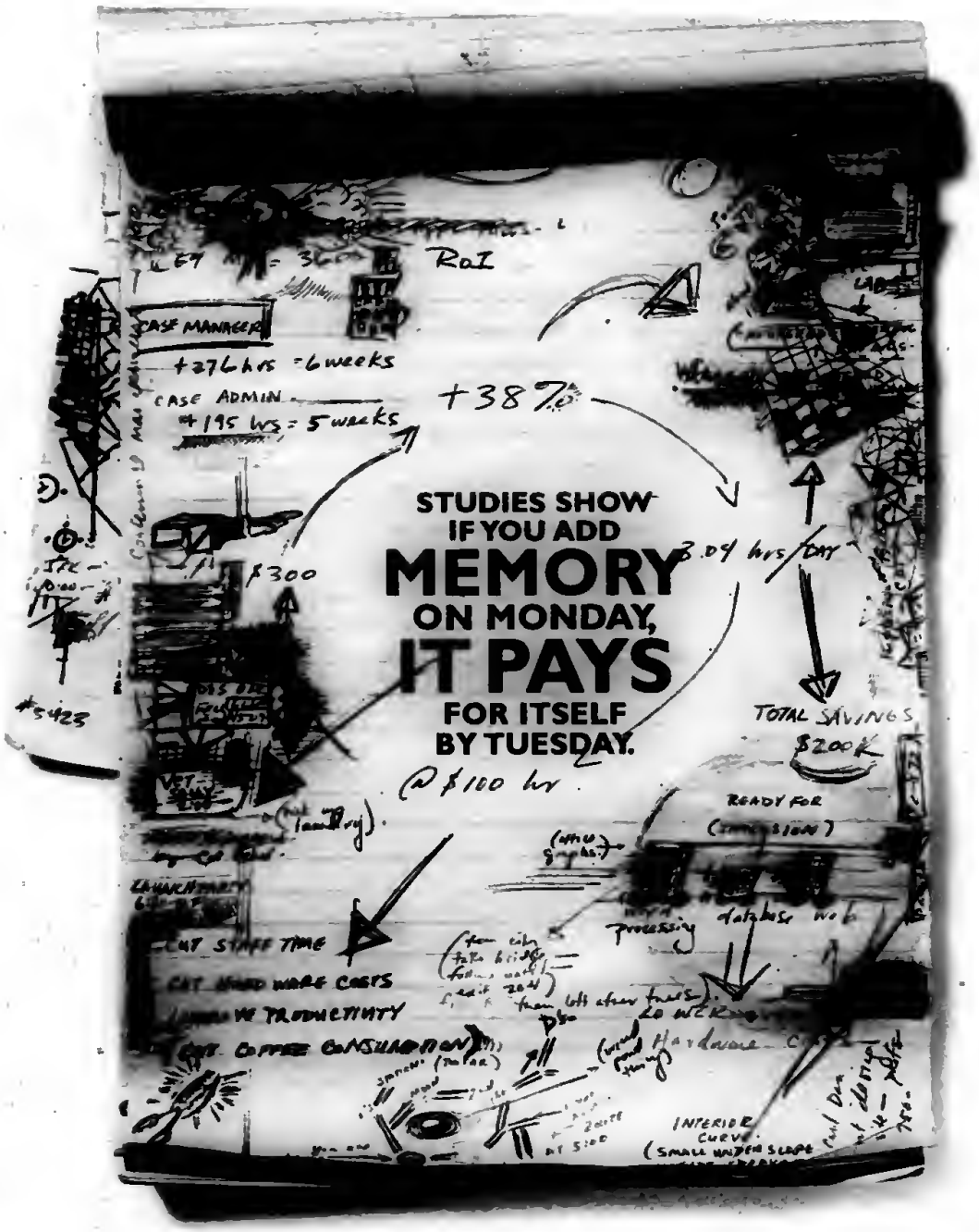

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